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The WCU is a randomized clinical trial evaluating the novel adaptation of telephone delivered motivational enhancement therapy for an Army population. The intervention is designed to reach soldiers with untreated substance use disorders, engage them in a brief discussion about their substance use behaviors, and build motivation to change problematic behaviors, limit use, and/or engage in treatment or formalized self help. The trial will enroll 240 active-duty soldiers at Joint Base Lewis McChord (JBLM) and test the intervention against a matched-attention control of treatment as usual, administered in the form of non-personalized educational information. As of this report's submission (30 September 2013), the trial has enrolled 210 soldiers and is on track to reach the target enrollment numbers.

As the trial is currently underway, primary outcomes (behavior change and treatment enrollment) have not yet been analyzed. However, preliminary analysis of focus groups, screening and baseline data have yielded reportable findings. We have developed qualitative recommendations for creating a culturally competent recruitment/outreach campaign for soldiers with untreated behavioral health needs. This analysis has been disseminated through a conference presentation and journal publication.

Additionally, baseline data has shown a high degree of untreated mental health concerns (anxiety, depression and PTSD symptoms) in the recruited sample. This finding suggests that substance abuse services may benefit the military by expanding their scope to address co-morbid psychopathologies common to active-duty personnel.

Finally, synthetic marijuana ("Spice") has been prevalent in the sample. Moreover, data has shown that soldiers perceive Spice use to be prevalent among fellow soldiers. Soldiers perceive its use to be more prevalent within the military than among civilians. The perception that Spice cannot be detected through urinalysis contributes to its actual and perceived prevalence.

These preliminary findings have been presented at national conferences and manuscripts with further analysis of these topics are under review.

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INTRODUCTION

This study has developed and tested a brief telephone-delivered motivational enhancement intervention (MET) for substance abusing military personnel who are not currently in substance abuse treatment. The intervention is designed to prompt: (a) a willingness to participate voluntarily in a self-appraisal of substance abuse behavior and consequences, (b) self-initiated change or enrollment in a treatment or self-help program, and (c) cessation of abuse of alcohol or other drugs. Following focus groups with 26 participants, this study recruited 242 military personnel who have a current substance use disorder via local publicity. The recruitment period extended over a period of 41 months. Following screening and a baseline assessment, enrolled participants were randomly assigned to one of two study conditions, each consisting of one 45-60 minute session by phone: (1) the experimental MET condition, or (2) a brief educational session. The MET session involved a counselor using motivational interviewing strategies to establish an empathic relationship, to support the caller in candidly exploring the problems he/she has experienced with alcohol/drugs, and weigh the pros and cons of future options. The educational session was didactic and provided information on alcohol and drugs. Participants in both conditions were reassessed at three and six months following exposure to the intervention. Completion rates for assessments and intervention sessions were high – all at 79% or greater, and preliminary analysis has shown strong evidence of the intervention's efficacy.

BODY

The activities outlined in this study's statement of work include: (1) Manualize participant recruitment mechanisms, (2) Develop and manualize MET intervention for the target population, (3) Conduct a randomized clinical trial, and (4) Report findings to pertinent Madigan Army Medical Center staff. As of the writing of this report at the end of year 5, the first three tasks have been accomplished and the reporting of study findings (#4) has begun. A description of how these tasks were achieved and of research findings follows.

1) Manualize participant recruitment.

Study Team Formation: Year 1 included the initial steps of hiring and forming a collaborative study team. A system for meeting with study investigators on 3 occasions per month was established. Project goals and goals specific to Year 1 activities were outlined and progressively worked toward throughout the year. Roles and responsibilities of team members were established. Relationships were formed with our collaborators at Joint Base Lewis-McChord and meetings were held monthly. Collaborators at Joint Base Lewis-McChord actively advise and educate our team regarding services available to army personnel, the cultural competence of our study materials, recruitment processes, and assist with recruitment of focus group participants and obtaining meetings with key figures on post. A Project Coordinator was hired and trained. In August of 2010, our counselors and research assistants were hired and began training.

Over Year 2, we experienced significant staff turnover. However, we were able to re-hire and train personnel in positions that were vacated so that Year 2 ended completely staffed. In August of 2011, a full-time Recruitment Coordinator was also hired. No significant staffing

changes were made in Year 3. Several staffing changes were made in Year 4. A new Recruitment Coordinator was hired at the beginning of the year and is now fully trained. Similarly, there was turn-over in the Assessor and Counselor positions; however, well-qualified replacements have been hired and trained. These changes did not interrupt study activities or timelines. As recruitment, intervention sessions and follow-up assessments were completed in the final quarter of Year 5, the study team consolidated to the team of Investigators, the Project Director, and Data Manager. Roger Roffman, a Co-Investigator retired in the third quarter of Year 5.

Human Subjects Protection Review: In Year 1 the study team submitted human subjects protection applications for two phases of the research: pre-trial activities that included procedures for recruiting and conducting focus groups, and all activities associated with the controlled trial. Human subjects protection reviews were conducted by the University of Washington (UW) Institutional Review Board (IRB) and the U.S. Army Human Research Protection Office (HRPO). IRB and HRPO approvals were obtained prior to the initiation of pre-trial activities.

Collaboration with Joint-Base Lewis McChord: Garrison Command provided a letter of support for the project in Year 1 and has continued to support the project throughout its duration despite changes in leadership. The study team formalized a working agreement with the Army Substance Abuse Program at JBLM, with Dr. Jolee Darnell, the program's director, being our primary collaborative partner. Study Investigators and staff met regularly with Dr. Darnell and her team throughout the course of the study and have continued the collaboration during the current analysis and dissemination stage of the project. The support of ASAP staff, particularly the Prevention Team, was integral to the study's successful recruitment process. Members of the ASAP team aided in distributing recruitment print materials and presented information about the study at a large number of briefings.

Focus Groups: In Year 1, separate focus groups were conducted with 10 military personnel who use substances, 7 military personnel who have completed or are currently engaged in substance abuse treatment, and 9 Joint Base Lewis-McChord service providers. Focus group participants were recruited to provide feedback on recruitment advertisements and intervention materials and provided ideas for advertisement placement. Findings from the focus groups were analyzed and used to edit the recruitment materials and to form an advertisement plan. A manuscript included in Appendix 1, describes the data collected in these focus groups and their implications for the development of recruitment materials.

Recruitment Mechanisms: Print media and in-person outreach were the primary means of participant recruitment. Multiple "campaigns," each consisting of 3-4 new ads were created throughout the project in response to feedback from participating soldiers and on-post collaborators. Examples of these print ads are included in Appendix 2, and described in the manuscript in Appendix 1. Print ads that were placed in areas of relative privacy (eg. locker rooms, restrooms, libraries, computer lab carrels) were more successful at reaching soldiers

than those placed in public areas, such as the walls of busy buildings. Brochures placed in waiting rooms were also a very successful means of reaching the target population.

ASAP Prevention staff, and the on-post Recruitment Coordinator hired by the study, provided the majority of in-person outreach. ASAP staff would present information about the study at various briefings and distribute various forms of print media (brochures, flyers, ad cards) and marketing materials that featured the study's recruitment phone number (key chains, playing cards, tote bags). Staff also attended on-post functions, such as Safety Stand-down and the Independence Day celebration to distribute these materials. Electronic media (Facebook ads & MWR website banners) was also explored but found to be relatively ineffective compared to these other less expensive avenues.

2) Develop and manualize MET intervention for the target population

MET & Personalized Feedback Report: A key element of the MET intervention is a Personalized Feedback Report (PFR). The counselor uses the PFR to guide the session, and it includes feedback for the soldier based on responses he or she provides in the baseline assessment. Some elements of the feedback include: the soldiers typical BAC, information on real and perceived drinking norms, as well as consequences of the soldier's substance use. In Year 1, focus group participants provided a critique of the PFR's first draft, which guided an iterative revision process. An example of the final design with data from a mock participant is included in Appendix 3.

Education Condition: Protocols for the comparison education condition were created in a process similar to the MET condition. A core didactic educational module that all comparison condition participants received included information on alcohol and blood-alcohol content. Soldiers in this condition, were also allowed to choose one or two other drugs to learn about in additional modules (eg., hallucinogens, opioids, synthetic marijuana, cannabis, stimulants).

Counselor Training: The study team created a training manual for both conditions that will be available for dissemination of the intervention. Dr. Walker and the Clinical Director led the 3-day counselor training workshop for each counselor that was hired during the course of the study, all of which were masters-level counselors with experience in motivational interviewing. The Clinical director listened to all MET sessions that were recorded and provided weekly supervision to counselors.

3) Conduct a randomized clinical trial

Assessment: All study instruments were chosen in Year 1 before recruitment began, however 6 months into the recruitment period, two novel drugs emerged as issues of concern for participating soldiers. These new drugs, MDPV or "Bath Salts," and synthetic marijuana were therefore added to measures that sought information about specific drug categories. The Project Director oversaw the development of a web-based assessment that was offered to any soldier who could not complete the session by phone, though relatively few participants chose this method.

Study Assessors trained thoroughly in administration of each instrument prior to their first contact with participating soldiers. The Project Director and a Co-Investigator listened to a

selection of recorded assessments on a monthly basis and provided feedback to the Assessors in order to insure the validity of collected data.

Human Subjects' Protection Review: An application was submitted to the UW IRB and approved on June 11, 2010 for main-trial activities. The approved application was then submitted to HRPO. Minor modifications were requested by HRPO and those were addressed and submitted to the UW IRB and HRPO and approved by UW and HRPO on September 15, 2010 and September 17, 2010, respectively. An application for a Certificate of Confidentiality (for the controlled trial) was submitted to the National Institute on Drug Abuse and approved on August 21, 2010 and was granted. All investigators completed the required Collaborative Institutional Training Initiative IRB training course.

No significant modifications to the IRB application have taken place, nor have any adverse events been reported to the board in Years 2, 3, 4 and 5.

Recruitment: Participant recruitment began in October of 2010 and continued to February 2014. In that time, 760 individuals called the study's toll-free number to inquire about the project. Four hundred and twenty-nine callers went on to complete a screening questionnaire, and of those, 290 were eligible to participate. Primary reasons for ineligibility were: no current substance use disorder (n=63, 45.3%), upcoming deployment (n=32, 23.0%), or current treatment enrollment (n=32, 23.0%). The majority of callers, who screened as eligible called the study after exposure to print media (n=159, 55.6%). Twenty-eight eligible callers (9.8%) were referred by a friend or family member to the study, and 21 (7.3%) called the study after attending a briefing where ASAP staff presented the study.

Of the 290 eligible callers, 4 declined participation at screening and 44 tacitly declined by not completing the baseline assessment in the allotted window, thus 242 active-duty soldiers with untreated substance use disorder completed baseline and enrolled in the study.

Appendix 4 contains a flow chart that describes participation and completion rates from initial calls through completion of the 6-month follow-up.

The majority of participants were male (93%), Caucasian (59%), and reported an E4 or E5 pay grade (66%). We achieved an 87% follow-up rate at 3-months and an 81% completion rate for the 6-month assessments. The majority of participants met criteria for alcohol or drug dependence (90%), as well as 84% meeting the clinical cut-off for PTSD (score of 28+ on the PTSD Checklist – Specific)

Intervention Delivery and Coding: To ensure the study Assessor was blind to participants' assigned condition, the study's Data Manager completed the randomization protocol following baseline. Blocking variables included gender and severity of substance use disorder (abuse or dependence). One hundred and twenty-two participants were randomized to the education control condition and 120 to the MET treatment condition. One hundred and six participants (86.9%) completed their education session and 95 (79.2%) completed their MET session.

In Year 4, an independent coder was hired to assess fidelity of the MET sessions to the principles of motivational interviewing. The coder will use the Motivational Interviewing Treatment Integrity Scales (MITI; Moyers, Martin, Manuel, & Miller, 2003) to rate 25% of all recorded MET sessions. This work has begun and is expected to be completed in late 2014.

Data Collection: Data collection ended in September of 2014. The table below contains completion rates.

Follow-Up Completion Rates		
Time-point	n	%
1-week (Intervention Process Assessment)	179	89.1% (of those who completed intervention session)
3-month	210	86.8%
6-month	197	82.1%

KEY RESEARCH ACCOMPLISHMENTS

- Pre-trial activities approved by UW and HRPO IRBs
- Focus groups completed
- Recruitment advertisements developed
- MET intervention developed,
- Personalized Feedback Report adapted for an active-duty population
- Education intervention developed
- Main trial activities approved by UW and HRPO IRBs
- Certificate of Confidentiality obtained for main trial
- Efficacy Trial was initiated
- Proposed sample size exceeded (N=242)
- Intervention delivery completed
- Data collection completed
- Video recorded a “mock” MET session as a training resource.
- Preliminary data analysis has found positive results for the intervention’s efficacy
- Dissemination of preliminary findings has begun
- To date, three manuscripts with study findings published in peer-reviewed journals

REPORTABLE OUTCOMES

Preliminary outcome data analysis regarding the impact of the intervention on treatment engagement and behavior change has begun. A list and synopsis of the findings thus far are below.

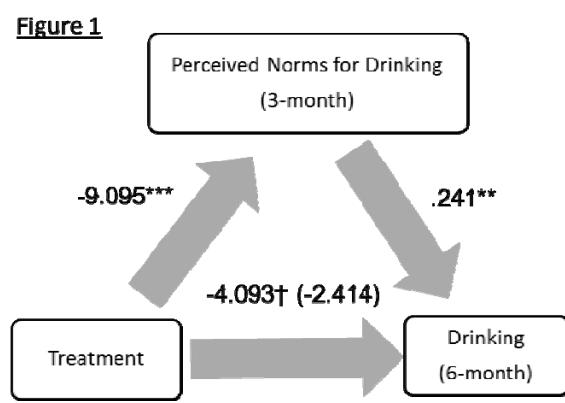
Marketing Strategies: As discussed previously in this report, a manuscript describing qualitative outcomes from focus groups with regard to marketing strategies was published in 2013. It is included in Appendix 1 (Walton et al., 2013).

Posttraumatic Stress Disorder: In November of 2012, Dr. Walker presented at the International Society for Traumatic Stress Studies (ISTSS) annual conference in Los Angeles. This presentation, titled *Motivating Treatment Engagement Among Active Duty Army Personnel with Co-Morbid Substance Abuse Disorder and Post Traumatic Stress Disorder: Applications from the Warrior Check-Up*, was part of a symposium focused on the treatment of co-occurring PTSD and substance use disorder in OIF/OEF Veterans (see Appendix 5 for abstract). This analysis found a high co-morbidity of post-traumatic stress symptoms and substance use disorder. Over eighty percent of the study's enrolled soldiers met proxy-diagnostic criteria on the PCL-S. The implications of this finding is that services explicitly targeting active-duty personnel with untreated substance use disorder will also attract those with significant untreated traumatic stress disorders. Intervention strategies in such programs will also therefore benefit from a trauma-informed perspective.

In addition to this analysis presented at ISTSS, preliminary analysis of the final data set has found that independent of time or treatment condition, those with higher PTSD symptomatology were more likely to engage in substance abuse treatment seeking behaviors over the course of the trial. Results also revealed an overall reduction in PCL scores. The proportion of participants meeting the PCL 28+ cutoff reduced significantly over time from 84% at baseline to 70% and 66% at three and six-month follow-up.

Normative Misperceptions: Analysis found that participating soldiers overestimated the percentage of Army personnel that engage in heavy drinking and that this misperception was associated with their own high levels of drinking. Further, while overestimations of their fellow

soldiers' drinking habits were associated with their own, perceptions of civilians' drinking habits were not. A manuscript describing these findings are included in Appendix 6. (Neighbors et al., 2014)



Preliminary analysis of the final data set confirmed these earlier findings, that normative misperceptions mediated drinking behavior. Figure 1 illustrates this relationship. The treatment effect on 6-month drinking was mediated by perceived norms for drinking at 3-months, indirect effect = -2.19 [95% CI: $-5.29, -.23$]

Synthetic Cannabis (SC): The use of synthetic marijuana was found to be high among participating soldiers. Discussion of this phenomenon was published in 2014 (Walker, Neighbors, et al., 2014) and can be found in Appendix 7. In sum, prevalence of SC as a drug of choice was found to be double that of typical, natural marijuana in the sample. It was also the only substance that soldiers perceived to be more prevalent among active-duty personnel than among civilians, suggesting that its use is indeed an important concern for military leadership.

Primary Outcomes – efficacy of MET intervention: Preliminary analyses found all participants significantly reduced their drinking over time and participants receiving the MET intervention reduced drinking significantly more than participants in the Education control condition. MET participants reduced their drinking by 56%, while Education participants reduced their drinking by 44% by the 6-month follow-up. Similarly, military specific consequences related to substance use (eg., “Reporting to work while drunk or high,” and “Not being promoted due to drinking or drug use.”) were reduced significantly more among MET participants. Participants in the MET condition also lowered rates of substance dependence diagnosis significantly more than the Education participants at the 6 month follow-up (88% of MET and 90% of Education participants met criteria for substance dependence at baseline; only 24% of MET participants met criteria at the 6-month follow-up compared to 42% of control participants). Substance abuse treatment seeking significantly increased for both conditions.

These findings, in addition to the effects of normative misperceptions were presented at the 2014 Military Health Systems Research Symposium in Ft. Lauderdale, Florida (Walker, Walton, et al., 2014).

CONCLUSION

The past year’s activities have focused on completing the efficacy trial, and beginning dissemination of preliminary findings and study concepts. The study successfully met its recruitment and retention goals with no foreseeable obstacles to meeting targets for data analysis and dissemination efforts in the proposed timeframe. Preliminary dissemination efforts have been well received by the public, fellow researchers and Army officials.

The findings, thus far, suggest that a Check-Up intervention can attract non-treatment seeking Army personnel who are struggling with substance disorders and that a one-session MET intervention increased treatment seeking and reduced drinking, military specific consequences and dependence diagnoses more than Education. PTSD symptoms were not addressed in recruitment materials and the clinical intervention only touched briefly on the subject as it related to substance use. Nevertheless, PTSD symptoms were significantly reduced over time and those higher in PTSD symptoms were more likely to seek substance abuse treatment, suggesting that a Check-Up approach focused on non-treatment seeking personnel with PTSD is warranted.

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ORIGINAL ARTICLE

Reaching Soldiers with Untreated Substance Use Disorder: Lessons Learned in the Development of a Marketing Campaign for the Warrior Check-Up Study

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The Warrior Check-Up, a confidential telephone-delivered intervention, is designed to reach active-duty soldiers with untreated substance-use disorder at a large US military base. This paper describes the development and successful implementation of the study's marketing strategies at the recruitment period's midpoint (2010–2012). Qualitative analyses of focus groups ($n = 26$) and survey responses ($n = 278$) describe the process of campaign design. Measures of demographics, media exposure, post-traumatic stress, anxiety and depression gathered from callers ($n = 172$) are used in quantitative analysis assessing the campaign's success in reaching this population. Implications, limitations, and suggestions for future research are discussed. Department of Defense provided study funding.

Keywords recruitment, marketing, motivational enhancement therapy, army, military, treatment engagement, check-up, stigma, substance use disorder, alcohol use disorder

INTRODUCTION

The United States Military faces public health challenges in addressing substance use disorders among active-duty personnel (Institute of Medicine, 2012). Over the past decade of ongoing wars, stressors, including multiple deployments, have taken a psychological toll on service members. At the same time, rates of substance use disorder have climbed, causing additional burdens to service members, their families and the military at large (Bray et al., 2009). Despite increased substance use in the Army, few soldiers are engaging in treatment (the terms "soldier" and "Army personnel" will both be used to denote

individuals of any rank with active-duty status in the US Army). The Warrior Check-Up (WCU) is a brief intervention to promote behavior change among soldiers not engaged in substance abuse treatment. This paper describes the development and successful implementation of a marketing campaign designed to engage this difficult to reach population.

With 20% of military personnel binge drinking on a weekly basis and 12% reporting use of illicit substances in the past month, the Institute of Medicine (2012) recently issued a major report that declared substance use in the military to be a public health crisis (Bray et al., 2009; IOM, 2012). On one Army base, 36% of soldiers were identified as engaging in hazardous or harmful alcohol use as measured by the Alcohol Use Disorder Identification Test (Mattiko, Olmsted, Brown & Bray, 2011). These rates have risen with the increase in combat deployments over the past decade. Calls have been made for structural and cultural changes in the military to manage the problem (Bray et al., 2009; IOM, 2012; Jacobson et al., 2008; Lande et al., 2008; Santiago et al., 2010).

Substance misuse has serious consequences for the military. Lost worker productivity, the most commonly endorsed consequence of alcohol misuse across all military branches, is reported by 32% of heavy drinkers (Bray, 2009; Williams, Bell, & Amoroso, 2002). Further, substance misuse increases burden on medical and installation commands, as it is linked to increased medical disease burden, mental healthcare utilization, legal problems, driving under the influence, and perpetration of domestic violence (Bray, 2009; Foran, 2012; Possemato, Wade, Andersen, & Ouimette, 2010).

Despite the prevalence and impact of problematic substance use, few receive treatment. Of 43,342 soldiers

screened for alcohol abuse postdeployment in 2008, nearly half ($n = 19,744$) were found to be at risk for alcohol abuse, yet only 215 (1%) were referred to the Army Substance Abuse Program (ASAP) (Clinton-Sherrod, Barrick & Gibbs, 2011). Moreover, rates of self-referral for alcohol use disorder treatment are low (IOM, 2012; US Army, 2009).

In the military, the barriers to substance use disorder treatment are formidable. Key aspects of military culture and hierarchy, as well as actual or perceived adverse consequences for fitness for duty status, promotion, command assignment, and security clearance, converge to dissuade active duty personnel in need of behavioral health services from requesting help (Britt, 2000; Castro, 2006). Stigma and negative beliefs about treatment are common. Seeking assistance for a substance use disorder is commonly seen as a sign of personal weakness demonstrating an inability to handle stressors faced by one's fellow soldiers (Gibbs, Olmsted, Brown, & Clinton-Sherrod, 2011). Fear that disciplinary action will be taken against someone who seeks treatment add to these barriers (Hoge et al., 2004; Vogt, 2011; Zinzow et al., 2012).

In addition to negative beliefs about treatment, practical barriers also exist. Because ASAP is not confidential and occurs during regular work hours, those contemplating requesting treatment may be apprehensive of the consequences of their commanders being notified and of their fellow unit members possibly believing they are attempting to shirk their duties by self-referring to treatment. Social isolation may exacerbate the experience of stigma when a soldier stops drinking and is thus excluded from one of the most common forms of bonding among Army peers (Gibbs, Olmsted, Brown, & Clinton-Sherrod, 2011).

Confidential treatment options, currently being tested in the Army, show promise for reducing barriers related to career damage and stigma. When it has been offered, confidential treatment has increased self-referral (Gibbs & Olmsted, 2011). These findings make a compelling case for designing and evaluating innovative approaches to promote motivation for change, voluntary treatment entry, and completion (IOM, 2012).

The Present Study

The WCU is a study comparing a motivational enhancement intervention and a psychoeducational intervention both being evaluated in a trial funded by the Department of Defense (DoD). Brief, delivered by telephone, and offering the option of anonymous participation, the WCU is designed to reach soldiers who have concerns about their use of alcohol or drugs, but are not enrolled in treatment. The study has two main goals. The first is to develop a marketing campaign that reaches and resonates with members of this population. This will be measured by the number of untreated soldiers who call the publicized phone number, taking the first step toward help-seeking for their substance use. The longer-term goal is to complete a randomized clinical trial evaluating the interventions described

above and adapted for soldiers with untreated substance use disorders.

This paper will focus on the development and evaluation of an outreach campaign. This goal was completed in two phases. In the first, focus group discussions and open-ended survey responses were analyzed to provide qualitative guidelines for creating an effective marketing plan. During the second phase, these guidelines were used to develop, implement, and evaluate the campaign. Explanation of methods and findings for both phases will be followed by discussion.

A "check-up" approach is a specific variant of motivational enhancement therapy (MET) originally developed to reach and attract voluntary participation from untreated heavy drinkers (Miller & Sovereign, 1989). The "check-up" approach is framed as a no-pressure opportunity to take stock of one's experiences and think through one's options. As such, marketing is an integral part of the intervention and has been successfully applied as a means for attracting people struggling with, but ambivalent about changing, high risk behavior, e.g., adults and teens with marijuana use disorders (Stephens, Roffman, Fearer, Williams, Picciano, & Burke, 2004; Walker et al., 2011), gay and bisexual men engaging in risky sexual behavior (Picciano, Roffman, Kalichman & Walker, 2007), and male domestic violence perpetrators (Mbilinyi et al., 2008). The WCU is an adaptation of the MET "check-up" model and is being tested as a means of engaging active-duty Army personnel stationed at Joint Base Lewis-McChord in the state of Washington.

PHASE 1: CAMPAIGN DEVELOPMENT

The first year of the trial was devoted to designing recruitment products to reach the target population. During that time, and continuing throughout the trial, staff employed by the Army Substance Abuse Program (ASAP) at the base were highly instrumental in training the researchers about military culture, helping to ensure that the project's marketing strategies were relevant and appropriate. Together, the researchers and ASAP staff members brainstormed a wide variety of potential marketing components, e.g., project names, logo designs, images, and messages. Subsequently, the members of three focus groups reviewed draft iterations of the project's marketing products. Finally, once recruitment had begun, additional feedback was sought by surveying members of the Army community attending a large on-base event.

Concepts and theory from the field of social marketing guided this developmental process. Social marketing uses communication strategies to increase knowledge or awareness, change thoughts, and/or stimulate behavior change (Kotler & Roberto, 1989). McGuire's (1985) communication and persuasion matrix offers a useful conceptual framework to develop marketing strategies, particularly those inclusive of a "call to action" such as prompting Army personnel concerned about or questioning their substance use to take a first step toward change.

McGuire's matrix incorporates inputs, consisting of five communication components, and outputs, i.e., the desired outcomes. The five communication components include: (1) *receiver*, the intended recipient of the message, with characteristics such as gender, age, race, rank; (2) *message*, the content being communicated (e.g., focusing on the negative impact of substance abuse, highlighting benefits of changing the negative behavior, and/or relief of talking to someone who understands); (3) *channel*, the means or strategies used to deliver the message to the receiver (e.g., advertisements, briefings, flyers); (4) *source*, the institution or person sending the message; and (5) *target*, the anticipated outcome (i.e., what action the receiver should be prompted to take).

Use of the matrix gave rise to a number of recruitment-related questions. Who are we trying to reach? What thoughts go through the mind of a soldier concerned about his/her alcohol, drug, or prescription medication use? What hopes and fears do soldiers have about reaching out for help? What message will likely resonate with this soldier and prompt a response to an ad? What variations in marketing will be needed to recruit an inclusive sample with reference to gender, age, race, and rank? What words and images will likely be counterproductive? What means of message delivery will be most likely to reach these soldiers? Where are the best locations to place these messages?

Phase 1 Methods

The University of Washington's institutional review board and the Army Human Research Protections Office approved both the clinical trial and the recruitment campaign development and evaluation process.

Focus Groups

Three separate focus groups were conducted: Army personnel who were current alcohol or drug users but not engaged in treatment ("nontreatment seeking"; $n = 10$), Army personnel who had completed or were currently enrolled in substance abuse treatment ("treatment-engaged"; $n = 7$), and Joint Base Lewis-McChord substance abuse and behavioral health service providers ("providers"; $n = 9$).

Participants were recruited through newspaper advertisements, flyers, and word of mouth from collaborators at ASAP. Advertisements made clear that participants would not be asked personal questions about their own use of substances and that personnel of all ranks, genders, and racial and ethnic backgrounds were encouraged to call.

Applicants were screened and selected to enhance diversity in terms of race/ethnicity, age, gender, and military rank, when possible. Of those invited, several were unable to attend due to scheduling conflicts. Only one female screened for the two focus groups of soldiers, but she was unable to attend. Consequently, the nontreatment-seeking and treatment-engaged groups were entirely male, whereas the provider group was split with five males and four females. The provider group also showed the most diversity of age with participants ranging from 24 to

60 years old. Both soldier groups included a participant in his forties, while the others ranged in age from 22 to 33. Of the 46 individuals who screened, only 5 identified as Hispanic, 2 of whom participated in the nontreatment-seeking focus group. The provider group was 88% and both soldier groups were approximately 60% Caucasian, which matched the racial distribution of the screening sample. Lastly, the majority of those screened for participation in the nontreatment-seeking group were higher ranking enlisted soldiers (E6 and above). One Private (E1) participated in the treatment-engaged group and the remaining soldiers ranged in rank from Specialist (E4) to Staff Sergeant (E6).

Each focus group lasted two hours and was held on base at an Army housing community center, outside of regular work hours. Focus group participants were compensated \$75 for their time if they were participating in off-duty hours.

After introductions of UW staff, an orientation to the focus group, and review and signing of consent forms, drafts of six mock advertisements were provided to the participants. This original set of ads consisted of basic adaptations of marketing materials from the research team's prior "check-up" studies with other populations.

Participants were first directed to look at each advertisement and record initial reactions individually without group discussion. Each ad was then discussed with the group as a whole. The focus groups ended with discussion centered on where and how the program should be promoted. Group facilitators guided the discussion to cover each of McGuire's (1985) communication components: receiver (target population), message (content and appeal), source (institution conducting the study), target behavior (suggested action for the receiver), and channel (medium for relaying the message to the receiver).

Survey

After recruitment had begun, project staff sought additional input from soldiers stationed at the base. The study team set up a booth at a large on-base event that all soldiers were required to attend. Large signs were posted advertising a raffle to win a \$150 gift certificate to a large local sporting and outdoors retailer. Those who entered the raffle were invited to answer a brief anonymous pen and paper survey. The primary purpose of this informal pilot test was to gain direct reactions to ads as well as suggestions for marketing channels from a convenience sample of Army community members. Respondents were asked to look at four project ads and then answer several free response questions: (1) Which ad do you think would get soldiers concerned about their drinking or drug use interested in the study? Why? (2) Where do you suggest we advertise on base and in the community? (3) Besides these ads, what ideas do you have for getting the word out about this project?

Data were collected from 279 respondents during the one-day event. Privacy concerns and the fast-paced, high volume collection period prohibited the gathering of demographic data. However, only soldiers, Army spouses

and service providers working on base were allowed to attend the event, so it is understood that all respondents were members of the Army community and had first-hand knowledge of the base and its culture.

Analysis

Guided by McGuire's framework, rudimentary qualitative analysis was used to first categorize data from focus group sessions and survey responses into categories pertaining to receiver, message, source, and channel. Coded quotations were then grouped to identify the emerging concepts or recommendations within each category of McGuire's framework. Differences in data between groups were noted to highlight the codes or concepts that were most salient to specific groups. Lastly, channels suggested by survey respondents were coded into groups that were simply tallied to find the most frequently suggested recruitment avenues and locations for print media placement.

Phase 1 Findings

Again using McGuire's framework, data obtained from focus group sessions, and community members' survey responses were categorized as pertaining to receiver, message, source, and channel. Qualitative review of responses did not reflect systematic differences between groups.

Receiver

Concern about stigma among members of the target population was the most salient issue to emerge from all focus groups. Multiple members of each group (25%; $n = 7$) suggested including assurances of confidentiality and noting that the WCU offered a "nonjudgmental" experience. "Tell [them] they can get help without someone breathing down their neck," a member of the treatment-engaged group suggested.

Other than the unifying concern over stigma and confidentiality, participants stressed that soldiers face a wide variety of unique stressors. A number of the draft ads presented to the focus groups featured discussion of deployment-related stress (e.g., "*The memories of war seem a lot to bear on my own*. If this sounds familiar, sometimes it helps to talk..."). Members urged the researchers to not focus only on soldiers who had been deployed. As one member currently in treatment commented, "It's not only deployments. You drink because of stress, relationships, and being away from family and friends." Indeed, many of the soldiers who subsequently enrolled in the project had not been deployed, but nonetheless faced significant stressors and struggled with anxiety, depression, isolation, post-traumatic stress disorder (PTSD) symptoms, and concern about stigma.

Message

Following McGuire's Communication Matrix, before developing a message it is necessary to consider the outcome that the message is intended to elicit. In this case, that outcome is a behavior, i.e., calling the study's toll-free number to learn more about the project. Getting to that behavior, however, is likely to first require that the receiver who

recognizes the existence of a problem, but is ambivalent about making change, perceives the "check-up" as both safe and desirable. An initial call to a substance use service provider of any sort is a major step. Therefore, the "check-up" message must help the ambivalent viewer perceive that there will be personal value from making that call.

With this in mind, four elements of a message emerged from discussions with focus group members and survey respondents. The message must: (1) connect with the viewer and spark self-reflection, (2) convey hope for change, (3) lower the threshold for seeking help, and (4) offer assurance of the program's legitimacy.

Connect with the viewer and spark self-reflection.

Seven soldiers and one provider emphasized that messages need to convey respect for the receiver and honor his/her service. Perceiving too much emphasis on pathology in one draft ad, one focus group soldier stated discouragingly, "They think I'm broke." A treatment-engaged soldier wrote that an ad which mentioned drinking as a way to "numb memories of war" would be "discriminating to soldiers if used off-post," i.e., reinforce a negative stereotype. Another soldier currently in treatment said that he would like an ad that "leaves a person feeling that they are a good soldier even though they may need help."

Several soldiers stressed the importance of including an image of a soldier in uniform with a combat patch, a symbol of having been deployed (Figure 1). However, a concern among service providers was that images of soldiers in combat and/or carrying a rifle in a war zone would be too invasive because they could trigger a negative reaction or memory. One provider specifically suggested "the memories of war line" should be deleted. A number of participants, primarily from the treatment-engaged group believed ads which directly discussed deployment and emotional numbing from combat confused the study's focus. "Is this [for] alcohol or PTSD or both – not sure," was one soldier's response to early advertisements. At the same time, members of each focus group and a number of survey respondents agreed that showing a uniformed soldier was a good way to immediately connect with the target audience.

Some of the input favored ads that reference specific substances, e.g., alcohol or prescription medication. The soldiers' groups suggested ad content asking viewers to consider how alcohol affects work responsibilities, loved ones, and life goals as a means to connect and spark self-reflection.

In terms of advertisement design, simplicity, visual appeal, and a concise and clear message were emphasized. Ads with unique or provocative imagery were favored. The most highly rated ad presented to survey respondents was one depicting a young man trapped in a bottle of beer (Figure 2). Second was an ad showing a bottle of pills caught on a fish-hook and asking, "Worried you might get hooked?" (Figure 3). Community members made positive survey comments about an ad depicting a young female soldier and another with a young man in civilian clothes, however, the most popular ad received over three times



**WARRIOR
CHECK-UP**

Questions or concerns about alcohol or drugs?

Take stock and explore your options...

- COMMAND NOT NOTIFIED
- PRIVATE, CONFIDENTIAL
- FREE, ALL BY PHONE
- NON-JUDGMENTAL
- EARN UP TO \$175

888-685-3889
www.warriorcheckup.org

A University of Washington Study
 Funded by the Department of Defense

FIGURE 1. “Signature Ad,” adapted from an earlier ad to feature a combat patch.



Looking for a way out?

Take stock and explore your options...

WARRIOR CHECK-UP

888-685-3889
www.warriorcheckup.org

- Command NOT notified
- Private & confidential
- Non-judgmental
- Free, all by phone
- Earn up to \$175

**WARRIOR
CHECK-UP**

A University of Washington Study
 Funded by the Department of Defense

FIGURE 2. “Bottle Ad,” most-preferred by survey respondents.



Concerned you might get hooked?

Take stock and explore your options...

WARRIOR CHECK-UP

888-685-3889
www.warriorcheckup.org

- Command NOT notified
- Private & confidential
- Non-judgmental
- Free, all by phone
- Earn up to \$175

 **WARRIOR CHECK-UP** A University of Washington Study
 Funded by the Department of Defense

FIGURE 3. “Hooked Ad,” targets concerns about prescription misuse.

the number of votes as these two more conventional images combined. Many preferred the top two ads because they were either “funny,” “eye-catching,” or “creative.” These ads attracted the viewer, and their unique imagery prompted more thought than the other ads.

Convey hope for change. Strong criticism came from focus group members, five from the treatment-engaged group and one from both of the other groups, who believed a draft ad did not offer hope for change or improvement. A number were concerned about ads mentioning that the WCU was a study. One soldier asked, “Will I be helped, or studied and made a stat?” Another concern related to the prospect for real change. Would WCU participants see an ad and believe they would just be talking about their problems? One soldier who was receiving treatment said of a specific ad, “I like how it refers to other substances. It means hope for things besides just alcohol.” Another soldier urged “Don’t be depressing,” suggesting the need for a positive message.

Further support for providing a message of hope may be extrapolated from survey respondents’ overwhelming preference for an ad which asked, “Looking for a way out [of the bottle]?” (Figure 2). This was the only ad to reference a path to recovery rather than consequences or ambivalence.

Lower the threshold for seeking help. A final and critically important element of a social marketing campaign to encourage help-seeking is to lower the threshold

for services. As reported previously, focus group participants encouraged including “confidential” and “nonjudgmental” in ad text. This feedback reiterated the concern held by active-duty personnel about potentially negative career consequences if they engage with Army social services. Additionally, stating clearly in ads that participation is “all by phone,” was seen as lowering the threshold for engagement.

Source

Perspectives for conveying the fourth important part of an effective recruitment message, a sense of the program’s legitimacy, falls under what McGuire describes as the Source component. To comply with Institutional Review Board requirements, each ad identified the project as a study being conducted by the University of Washington. Fortunately, focus group participants saw the university’s role as giving the project credibility and reinforcing the assurance that military Command is not involved.

The draft ads seen by focus groups and survey respondents also included the phrase “funded by the DoD,” which was a required part of informed consent but not advertisements. Later feedback from survey respondents conveyed concern about this phrase as it relates to confidentiality. If the DoD funded the study, would the Army have access to identifiable information about participants? Soldiers in the focus groups did not raise this concern. On the other hand, on-base service providers and

TABLE 1. Survey respondents' suggested marketing channels

	N	%
AAFES locations (PX, shopettes, commissary, class 6, etc.)	192	29.2%
Paid commercial media placement (TV, billboards, fences on post)	100	15.2%
Briefings (readiness/reintegration)	64	9.7%
Gyms & rec centers	37	5.6%
Unit/company/brigade areas and barracks	55	8.4%
Facebook/internet	29	4.4%
MWR facilities and events (other than gym)	28	4.3%
Word of mouth (family, friends, commanders)	26	4.0%
Welcome and processing center	21	3.2%
Medical facilities (clinics, hospital, pharmacies, etc.)	18	2.7%
On-post service agencies (ASAP, ACS, ACAP, BOSS, FRG's, etc.)	17	2.6%
Other (restrooms, banks, DFACs, etc.)	70	10.7%
Total	657	100%

Note. 297 respondents provided 657 suggestions.

commanders communicated to the researchers that noting the DoD funding source on posters provided the legitimacy needed to justify displaying marketing materials at various locations under their control. It gave the study official, military-approved status.

Channel

The 279 survey respondents offered 657 suggestions regarding marketing channels. As seen in Table 1, the most commonly suggested channel identified by the base's community was AAFES (Army and Air Force Exchange Services) locations on base such as the Post Exchange and other retailers. AAFES was followed by paid media placement such as television commercials and billboards. Briefings were the third most endorsed channel. The "other" category encompassed a wide range of suggestions such as bars/clubs, restrooms, dining facilities, on-base circulars, and libraries. Identifying specific marketing locations or channels was not a primary topic in the focus groups.

PHASE 2: CAMPAIGN IMPLEMENTATION AND EVALUATION

In the next phase of the project, study staff revised ads, created new ones, and pursued marketing channels according to the guidelines established in the first phase. Then, after nearly 2 years of implementation, an evaluation of the campaign described who it reached in terms of demographics and clinical symptom severity, as well as channel effectiveness. Evaluation methods and findings will follow a discussion of the implementation process.

While project ads portray soldiers wearing uniforms with combat patches, the staff learned to be wary of making any assumptions about the experience of being in a war. A statement familiar to those who have worked with

soldiers is that "no one can understand what war is like who has not been through it." This points to the necessity of deference to service in combat without presumption of its personal meaning.

Language in early advertisements that had asked rhetorical questions about problems related to combat exposure was dropped entirely. Instead, subsequent ads directed rhetorical questions at soldiers' ambivalence about confronting problematic substance use ("Wonder if you might drink or use too much?" "Questions about your use of alcohol or drugs?"), and potential negative consequences of use ("Alcohol or drugs slowing you down?" "Alcohol or drugs holding you back?") The intention was to elicit the viewer's thoughts specifically about substance use behavior rather than past combat experiences.

Responding to feedback about simplicity, later ad materials greatly reduced the number of words per ad from over 70 in the first round to less than 40 in later versions. A more concise message had a greater likelihood of reaching the intended audience. But, because the project's messages were more extensive than any one ad could convey, multiple versions of ads were developed. With ample ad placement of multiple versions, viewers were exposed to all of the project's messages but in smaller, more easily digested doses. Additionally, a webpage was created that includes all project ads for those seeking more information prior to picking up the phone.

Lastly, survey respondents' strong preference for ads depicting a young man trapped in a beer bottle and pills caught on a hook suggested that somewhat provocative images had more impact. It was hoped that illustrating a problem in a novel way had a better chance of bypassing one's usual defenses and striking a chord of self-reflection, so these ads were used prominently in the campaign.

Though discussing a serious subject, project staff learned from WCU participants that it was important to keep the tone of ads from becoming dour. This project sought participants who were ambivalent about change and likely not fully perceiving the darker side of their use. One who is ambivalent about change – seeing both positive and negative consequences of use – would likely be put off by too grim of a message. Later ads conveyed messages that recognize the viewer's potential for a life with fewer negative substance-use related problems.

To avoid concerns of a time burden or judgmental attitudes, the WCU was described in ads as a brief and non-judgmental opportunity to take stock of one's behaviors and explore options. A tagline ("Take stock and explore your options") was added to emphasize a no pressure conversation in lieu of committing to behavior change. The term "check-up" in the project name was intended to differentiate this conversation from substance abuse treatment. The program's logo contains an image of a telephone and the ads included the phrase "all by phone." These additions underscore a minimal time burden associated with participating and offer another level of protection against disclosure of problems, potential career damage, and social stigma.

TABLE 2. Response and completion rates by recruitment channel

	Total	Print and visual	Briefings	Family and friend	Providers and military leaders	Test (<i>p</i> value)
All screened callers (<i>n</i>)	262	164	48	21	27	
Eligible (<i>n</i>) % of all callers	172 66%	110 42%	29 11%	14 5%	19 7%	$\chi^2 = .98$
Enrolled (<i>n</i>) % of eligible	136 79%	91 53%	21 12%	9 5%	15 9%	$\chi^2 = 4.61$
Completed (<i>n</i>)* % of eligible	106 78%	73 53%	15 11%	7 5%	11 8%	$\chi^2 = .98$

Note. Callers with unknown channel not included (*n* = 19).

*Participants who completed the intervention session.

All recruitment materials stated that the program is free and participants would be compensated for their time. At the initial screening call, the interviewer explained to participants that they would be compensated for completing interviews over a seven month period but would not receive payment for their conversation with the counselor. For active-duty Army personnel, one of the only ways to get confidential behavioral health services is to go to a civilian provider and pay out-of-pocket. Consequently, soldiers who are exploring their options may associate non-military confidential services with high fees, so it was important to be clear about the no-cost aspect of the WCU.

All suggested channels for marketing were pursued and can be grouped into three main categories: (1) print and visual media (2) presentations at soldier briefings, and (3) outreach to military leaders, service providers, and military families.

Print and Visual Media

Study staff contacted the directors or facility managers of all recommended locations to seek permission to display printed recruitment materials. Materials included brochures, half-page flyers, stacks of business-card sized ads, larger wall posters, and acrylic stands. All materials were printed with a variety of designs.

Unfortunately, AAFES facilities, the most recommended channel for media placement, was the only on-base entity that prohibits any form of recruitment marketing, stating their mission is strictly to provide commerce. Study staff eventually gained direct access to all locations recommended for print ad placement, except for company areas and barracks where non-military civilians are prohibited. Fortunately, the staff gained indirect access to these areas having developed a strong relationship with an on-base champion of the study, an upper-level ASAP employee who worked within the system to access these locations. Part of her job included giving presentations at each unit, and she was able to talk with unit commanders about the WCU at those times and gain permission to post materials. She also gave trainings to Unit Prevention Leaders and had them take materials back to barracks and Company offices.

Paid commercial ad placement, the third most recommended channel, included ads in local periodicals, on-base billboards or banners, and on Facebook. Ads ranged in size from an eighth of a page to a half page in circulars

distributed solely on the base, as well as civilian publications with a large military audience. Advertising space was also purchased for a billboard near the base's entry gate. A website was created with a home page featuring the project's standard ad images and language, links to a fuller project description, frequently asked questions, and contact information. Facebook ads that linked to this website were also attempted.

Briefings

ASAP collaborators were integral to implementing the third most suggested recruitment channel, soldier briefings. Several obstacles, e.g., unpredictable scheduling, travel limitations due to distance between study offices and base, and rules regarding nonmilitary access to briefings limited project staff's ability to present at briefings. Fortunately, the strong relationship negotiated with ASAP provided proxy. ASAP prevention leaders were trained to present the study, provided PowerPoint slides for inclusion in their presentations, and given access to materials for distribution. Collaborators included the WCU in Reintegration Briefings for soldiers returning from deployment, substance use education and prevention presentations to units, and Newcomer Orientations for service members newly stationed at the base.

Outreach to Leaders, Providers, and Families

The majority of channel recommendations pertained to visual media placement. However, WCU staff and on-base collaborators believed it was also important to reach out to military leaders, on-base social service providers and military families. Staff met with directors from multiple departments, including Social Work; Chaplain Corps; Child, Youth & School Services; Army Community Services; Suicide Prevention; Military and Family Life Counselor Program; Better Opportunities for Single Soldiers (BOSS); and Non-Commissioned Officer Academy and the Warrior Transition Battalion. Program information and recruitment materials were given to the program leaders for distribution.

When meeting leaders and making presentations, staff provided print materials and guided their explanations with talking points that mirrored print advertisements in order to maintain a cohesive message across channels. Presentations emphasized confidentiality and the study's low-pressure, noncoercive approach. Individuals were encouraged to recommend the study and distribute project

TABLE 3. Channel effectiveness by participant characteristics, eligible participants ($n = 172$)¹

	Print and visual ($n = 110$)	Briefings ($n = 29$)	Family and friends ($n = 14$)	Providers and military leaders ($n = 19$)	Test (p value)	Total
Gender (n , % male)	99 (90%)	28 (96%)	11 (79%)	18 (95%)	$\chi^2 = 4.14 (.25)$	156 (91%)
Age (mean, SD) ³	28.7 (6.66) ^b	25.3 (3.75) ^{ab}	23.4 (2.71) ^a	26.5 (7.64) ^{ab}	$F (3, 171) = 4.76 (.003)$	28 (6.51)
Ethnicity (n , % white)	61 (55%)	17 (59%)	9 (64%)	9 (47%)	$\chi^2 = 7.53 (.28)$	96 (56%)
Marital status (n , % married)	55 (50%)	14 (48%)	7 (50%)	6 (32%)	$\chi^2 = 7.58 (.27)$	82 (48%)
Rank / pay grade					$\chi^2 = 5.10 (.53)$	98 (57%)
E1–E4	57 (52%)	9 (32%)	11 (79%)	12 (63%)		61 (36%)
E5–E9	44 (40%)	1 (4%)	2 (14%)	6 (32%)		12 (7%)
Officer	9 (7%)		1 (7%)	1 (5%)		
Deployment (n , % deployed)	89 (81%)	25 (86%)	11 (79%)	16 (84%)	$\chi^2 = .61 (.89)$	141 (82%)
Combat (n , % exposed)	82 (75%)	19 (66%)	10 (77%)	15 (79%)	$\chi^2 = 1.38 (.71)$	126 (73%)
Alcohol use disorders						
Abuse	13 (12%)	7 (24%)	0 (0%)	2 (11%)	$\chi^2 = 6.81 (.34)$	22 (13%)
Dependence	87 (80%)	21 (72%)	12 (86%)	16 (84%)		136 (79%)
Substance use disorders						
Abuse	4 (4%)	0 (0%)	0 (0%)	0 (0%)	$\chi^2 = 2.98 (.81)$	4 (2%)
Dependence	27 (25%)	8 (28%)	5 (36%)	5 (26%)		45 (26%)
PTSD symptom severity (mean, SD) ²	45.87 (17.63)	45.42 (16.85)	52.61 (14.25)	47.02 (17.04)	$F (2, 127) = 1.52 (.22)$	47 (17.04)
Generalized anxiety disorder (mean, SD) ^{2,3}	9.28 (5.78) ^{ab}	9.04 (4.94) ^c	12.83 (6.55) ^b	9.87 (5.93) ^{ab}	$F (2, 134) = 3.80 (.03)$	9.9 (5.93)
Depression (mean, SD) ²	10.23 (6.30)	11.29 (5.05)	13.30 (6.48)	10.93 (6.22)	$F (2, 133) = 2.32 (.10)$	10.9 (6.22)

¹Callers with unknown channel not included ($n = 19$).²Measure administered only for enrolled participants ($n = 136$); summed severity score (PCL-S; GAD-7; PHQ-9).³ $p < .05$. Means and proportions with different superscripts (a or b) are significantly different from one another.

marketing materials to any soldier who disclosed concerns or asked questions about their substance use or treatment options.

Phase 2 Methods

Two years into the 3-year recruitment period, preliminary analyses were performed to evaluate the marketing campaign's reach. All callers answered a marketing exposure questionnaire that asked where they heard about or saw advertisements for the study. At screening, participants completed a demographic questionnaire (gender, age, race, ethnicity, rank/paygrade, deployment history, combat exposure, etc.), and the Structured Clinical Interview for DSM Disorders – Substance Use Disorder section (Kranzler, Kadden, Babor, Tennen & Rounsville, 1996). In addition to baseline measures of substance use behaviors, histories, beliefs, and motivators not analyzed here, participants completed the PTSD Checklist (PCL-S), a 17-item measure of PTSD symptom severity; the GAD-7, a seven-question scale of generalized anxiety disorder; and the PHQ-9 measuring depression severity (Keen, Kutter, Niles & Krinsley, 2008; Kroenke, Spitzer & Williams, 2001; Spitzer, Kroenke, Williams & Lowe, 2006). These measures were summed to create a total severity score.

The following analyses concerning the demographics of those reached by various marketing channels are based on enrolled participants who completed a screening assessment during the first 93 weeks of recruitment ($n = 262$). Analyses of participants' psychological health (anxiety, depression, and PTSD) and intervention completion rates are based on enrolled participants, those who were eligible at screening and then completed the baseline assessment, by week 93 ($n = 136$).

Data analyses were completed using one-way ANOVAs for continuous measures and chi-square tests for categorical measures. In the event of an overall significant finding, post hoc tests were completed using the least square differences algorithm to test for pair-wise differences among continuous variables, and 2×2 chi-square tests were used to measure pair-wise differences among categorical variables. The significance level was set at .05. Participants with unknown channels were not included in the analyses ($n = 19$).

Phase 2 Findings

Response Rates

Over the first 93 weeks of recruitment, 459 individuals responded to the marketing campaign and called to inquire. Of those callers, 262 were interested in enrolling and completed the initial 15-minute screening. One-hundred and 72 callers met eligibility criteria for inclusion in the randomized trial of MET.

Participants responded to one or more of four main recruitment channels utilized by the study. Print and visual media generated 63% of all screened callers. Eight percent of callers who completed the initial screening came to the

study via personal referrals (spouse, friend, or fellow soldier), 18% called in response to military briefings, and the remaining 10% were referred through service providers or military leaders. Advertising through paid media (newspapers, circulars, billboards, and Facebook) was not generally successful in recruiting participants as less than 2% of all calls identified these as referral sources. In contrast, flyers and posters accounted for 56% of all referrals, with company areas (16%), gyms (23%), and the welcome center (19%) being the most common sites for responding to flyers. Reintegration briefings (13%) were also successful in generating referrals. While there was some variation in the percentage of overall callers elicited by the different channels who were eligible for the project (ranging from 60% of those responding to briefings to 70% of those referred by service providers or military leaders), this response rate did not differ statistically across channels (see Table 2).

Overall, 136 callers completed the initial baseline assessment and were enrolled in the study, representing 49% of all callers who completed screening and 79% of callers who were eligible at screening. Seventy-eight percent of the participants who completed baseline also completed treatment, which is 38% of screened callers. Although there was variation across channels, there were no significant differences in initial study enrollment (60% from briefings to 70% from service providers and military leaders), completion of our baseline assessment (64% from family and friends to 84% from advertisements and flyers), or treatment completion (71% from briefings to 80% from advertisements and flyers) based on channel of recruitment.

Channel Effectiveness by Specified Participant Characteristics

Table 3 presents data on specific participant characteristics, with reference to each channel, for callers who were both interested and eligible for the study ($n = 172$). Demographics did not generally differ significantly across the four mechanisms for recruitment. Thus individual gender, marital status, race/ethnicity, and military rank did not significantly differ across recruitment channel. There were significant differences with reference to age $F(3, 171) = 4.76, p < .01$, where significantly younger participants were recruited via family and friends (mean age: 23.43 years) or briefings (mean age: 25.31 years) compared to older participants recruited via advertisements and flyers (mean age: 28.68 years). There were no significant differences in channel of recruitment regardless of deployment, combat exposure, or alcohol or substance use diagnoses. Mental health symptoms did appear to differ by channel among those who were enrolled in the study. There was no effect for PTSD or depression symptom severity in channel effectiveness. However, those who were referred by family and friends had significantly greater anxiety symptoms than those who responded to military briefings $F(3, 134) = 2.85, p < .05$.

CONCLUSIONS

Substance abuse is at the forefront of public health concerns facing the military. Recently, the DoD charged the Institute of Medicine with the task of assessing and analyzing the policies and programs related to substance abuse in the military (IOM, 2012). Overwhelmingly, the IOM committee identified several barriers that limit access to substance abuse treatment and recommended that efforts should increase to prevent substance use disorders and increase access to care, including encouraging self-referral to treatment. The WCU is one program currently being evaluated designed to address untreated substance abuse in the military. Lessons learned through recruitment efforts of this project will be valuable for other researchers focused on the military, treatment providers, and those in the DoD who inform policies and campaigns to promote health.

The WCU project presents one method for designing recruitment advertisements targeting a military population. Focus groups with selected stakeholders as well as continual feedback from interested callers and soldiers on base highlighted the need to be culturally competent when creating ads and the value of continual dialogue with the target population. Additionally, on-base recruitment efforts in the form of advertisements, flyers, and cards proved most successful in attracting the target population. Having an on-base presence was also valuable. Finding and cultivating a program "champion" from within the military is essential in navigating the many processes for approval to advertise on base as well as identifying and accessing opportune interactions with soldiers (soldier processing, substance use prevention trainings, etc.). Given that 36% of participants called the study in response to a briefing, a service provider or friend or family member, personal interaction that educates the soldier about the service offered is also key. This included WCU staff's presence at events, ASAP prevention personnel informing soldiers of the project, and briefing unit commanders to increase their ability to refer to the project for soldiers they were concerned about.

The content of the messages are vital as well. Focus groups and survey participants shaped the wording and images of the advertisements and brochures. The messages tapped into ambivalence surrounding substance use, but also conveyed hope for a solution. Keeping messages brief and highlighting important aspects of the project that address concerns about stigma such as confidentiality, and command not being notified helped to decrease barriers to calling. Focus groups and interactions with soldiers (including participants) reiterated and emphasized the idea that confidentiality is a key to action in the military. This is one of the most common aspects that participants point to when asked what attracted them to participate in the study. Additionally, how the confidentiality of the project eased their fear of punishment from the Army about seeking help for a substance use problem was also a very common sentiment expressed. Although the ads intentionally evolved away from associating drinking with memories of

war or PTSD, consonant with others' findings, the rate of trauma exposure, PTSD, anxiety, and depression among the interested callers was high. This suggests that marketing for a substance use program can and will reach soldiers who are struggling with mental health and may create an opportunity for providers to assess and provide feedback to enhance treatment seeking for these issues as well.

One noteworthy limitation of the study is that ads mention financial compensation for research participants. This adds to the service's attractiveness and therefore limits the generalizability of these findings to social service providers and studies that do not offer compensation. Additionally, a cost analysis of various channels was not possible with available data.

Overall, the check-up model has been successfully adapted for use with a variety of at-risk populations (see Walker, et al., 2007). Successful marketing has been key to all these adaptations. How do you get at-risk individuals to reach out for help has been the question at the heart of the marketing for the check-up. The WCU suggests that an adaptation of the check-up to specifically focus on soldiers has been effective in reaching individuals who are troubled by their substance abuse, but are unsure of what to do. And specifically, that marketing materials can be successfully developed with thoughtful and persistent feedback from military personnel. Further research should continue to explore the utility of a check-up model for military populations, particularly for addressing highly stigmatized topics such as substance abuse, PTSD, suicide, and military sexual trauma.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

RÉSUMÉ

Titre

S'adresser aux soldats atteints de troubles non traités liés à la consommation de drogues: Leçons tirées de l'élaboration d'une campagne marketing portant sur l'étude du bilan de santé du soldat.

Titre abrégé

S'adresser aux soldats atteints de toxicomanie non traitée

Synthèse

Le bilan de santé du soldat, consultation confidentielle effectuée par téléphone, s'adressait aux soldats d'une importante base militaire américaine, en cours d'exercice, atteints de troubles non traités liés à la consommation de drogues. Cet article décrit l'élaboration et la mise en œuvre réussie des stratégies marketing de l'étude à mi-parcours de la période de recrutement (2010–2012). Les analyses qualitatives des groupes à l'étude ($n = 26$) et les réponses aux enquêtes ($n = 278$) définissent le processus d'élaboration de la campagne. Les mesures des données

démographiques, de l'exposition aux médias, du SSPT, de l'anxiété et de la dépression recueillies auprès des appelés admissibles ($n = 172$) sont utilisées dans l'analyse quantitative permettant d'évaluer si la campagne a bien atteint cette catégorie de population. Les retombées, les limites et les pistes de futures recherches sont analysées. L'étude est financée par le département de la Défense des États-Unis.

RESUMEN

Título

Ayudar a soldados con trastornos por abuso de sustancias sin tratar: lecciones aprendidas en el desarrollo de una campaña publicitaria para el estudio de revisión de combatientes

Título abreviado

Ayudar a soldados con abuso de sustancias sin tratar

La revisión de combatientes, una intervención telefónica confidencial, está diseñada para ayudar a soldados en servicio activo que sufren trastornos por abuso de sustancias sin tratar en grandes bases militares estadounidenses. Este documento describe el desarrollo y la implementación exitosa de las estrategias de comercialización del estudio en el punto medio del período de reclutamiento (de 2010 a 2012). Los análisis cualitativos de los grupos de discusión ($n = 26$) y las respuestas a las encuestas ($n = 278$) describen el proceso de diseño de la campaña. Los datos de mediciones de estadísticas demográficas, exposición en los medios, trastorno por estrés postraumático (Post Traumatic Stress Disorder, PTSD), ansiedad y depresión recopilados de las personas elegibles que llamaron ($n = 172$) se utilizan en análisis cuantitativos para evaluar el éxito de la campaña para ayudar a esta población. Se están analizando las implicancias, limitaciones y sugerencias para una futura investigación. El Departamento de Defensa financió el estudio.

THE AUTHORS



Clayton Neighbors, PhD—Dr. Clayton Neighbors received his PhD from the University of Houston. He is currently a Professor and the Director of the Social Psychology Program at the University of Houston. His work focuses on social, motivational, and spiritual influences in etiology, prevention, and treatment of health and risk behaviors. He has applied his research

toward better understanding and alleviating problems related to alcohol and substance abuse, intimate partner violence, problem gambling, body image and eating disorders, and aggressive driving. Support for this research has been provided by the National Institute on Alcohol Abuse and Alcoholism, the National

Institute on Drug Abuse, the National Institute on Mental Health, and the Department of Defense.



Debra Kaysen, PhD—Dr.

Kaysen is an Associate Professor and is the Depression Therapy Research Endowed Professor in the Psychiatry and Behavioral Sciences Department at the University of Washington. She has received grants from the National Institute of Alcohol Abuse and Alcoholism, the National Institutes of Drug Abuse, and the Alcohol Beverage Medical Research

Foundation. Dr. Kaysen's research is situated at the interface of PTSD and Addictions, and includes both etiologic and prevention/treatment-oriented studies. She has published over 50 journal articles and was awarded the New Investigator Award from the Women's SIG of the Association for Behavioral and Cognitive Therapies and an early Career poster award from Division 50 of the American Psychological Association and NIAAA.



Denise Walker, PhD—Trained

in clinical psychology, Dr. Walker's expertise is in the fields of addictive behaviors and Motivational Enhancement Therapy. Her research focuses on the development, testing, and implementation of interventions that bring about positive changes in patterns of behavior. Dr. Walker has applied her work to a number of hard-to-reach populations

including adolescents, marijuana-dependent adults, substance-abusing active-duty military personnel, and domestic-violence perpetrators. She received her MS and PhD in clinical psychology from the University of New Mexico and is currently a Research Associate Professor and the codirector of the Innovative Programs Research Group at the University of Washington.



Lyungai Mbilinyi, PhD—Research Assistant

Professor Lyungai Mbilinyi's research interests focus on intimate partner violence prevention and early intervention and the intersections of race, gender, and class among social and health issues. Dr. Mbilinyi began her social work career over 15 years ago as a domestic violence group counselor. It was during her tenure as a

counselor when she became interested in applied research and evaluation. Dr. Mbilinyi has taught research courses for Masters of Social Work students. She has published on children's exposure

to domestic violence, and marketing to and intervening with intimate partner violence perpetrators. Born in Dar Es Salaam, Tanzania, Dr. Mbilinyi has a personal and professional interest in the experience of African immigrants and refugees in the United States. Dr. Mbilinyi also codirects the School's Innovative Programs Research Group.



Roger Roffman, DSW—Dr. Roger Roffman is a Professor Emeritus at the University of Washington School of Social Work. His research interests focus on behavioral interventions in the fields of addictive disorders, marijuana dependence, and sexual health. His studies of check-up interventions are tailored for individuals who have concerns about current behaviors that are

causing adverse effects, but are ambivalent about committing to change. His studies of behavioral counseling interventions focus on supporting individuals to change their behaviors. Dr. Roffman founded the Innovative Programs Research Group in 1987.



Thomas Walton, MSW—Mr. Walton has engaged in research with a diversity of populations, including homeless adolescents, people living with dementia, perpetrators of domestic violence, and soldiers grappling with substance use. Mr. Walton is a social worker and Project Director for the WCU study at the University of Washington's Innovative Programs Research Group. He earned his Master

of Social Work from the University of Washington, focusing on policy and social service systems.

GLOSSARY

Check-up model: A form of brief intervention designed to attract individuals with untreated behavioral health issues to facilitate self-appraisal and to promote self-referral to treatment. Social marketing is used to attract the target population to the service. Following an assessment of the client's behaviors, beliefs, and perceived norms, the counselor uses a Motivational Interviewing approach to engage the client in a no-pressure discussion of the problem area with the goal of bolstering one's motivation to make positive changes.

McGuire's communication matrix: A conceptual framework to develop marketing strategies, particularly those inclusive of a "call to action" or behavior change. It consists of five communication components and outputs, i.e., the desired outcomes: (1) receiver, the intended recipient of the message; (2) message, the con-

tent being communicated; (3) channel, the means or strategies used to deliver the message to the receiver; (4) source, the institution or person sending the message; and (5) target, the anticipated outcome (i.e., what action the receiver should be prompted to take).

Motivational interviewing: A client-centered counseling style designed to promote self-reflection and self-appraisal of beliefs and problematic behaviors in order to overcome ambivalence about behavior change.

Social marketing: Communication strategies designed to increase knowledge or awareness, change thoughts, and/or stimulate behavior change.

Substance use disorder: A term used to encompass both Substance Abuse and Dependence disorders as described by the Diagnostic and Statistical Manual of Mental Disorders, 4th edition.

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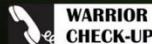
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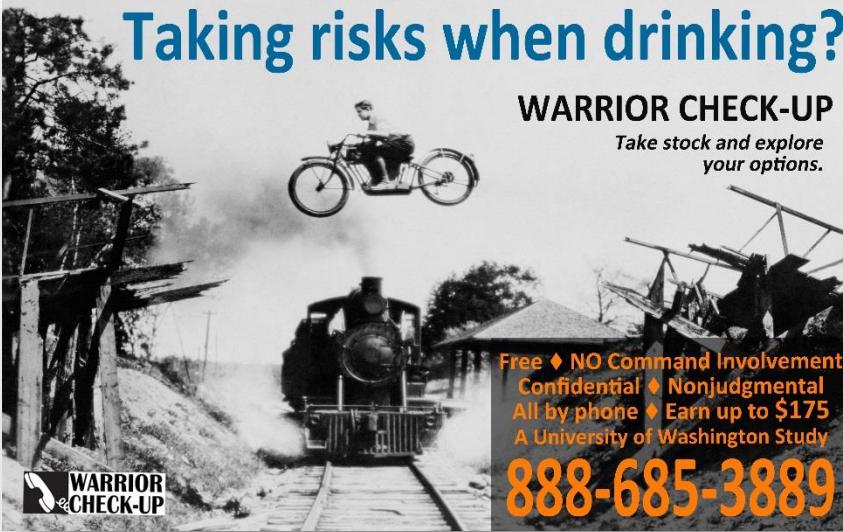
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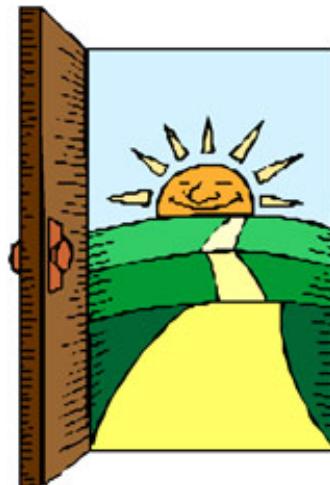
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12/6/2010



THE WARRIOR CHECK-UP

Personal Feedback Report



Innovative Programs Research Group
School of Social Work
University of Washington

This report has been prepared specifically for you. It summarizes some of the information you have shared with us during our recent conversations.

As we review it together, please ask any questions that come to mind, make corrections if you spot any errors, and offer comments.

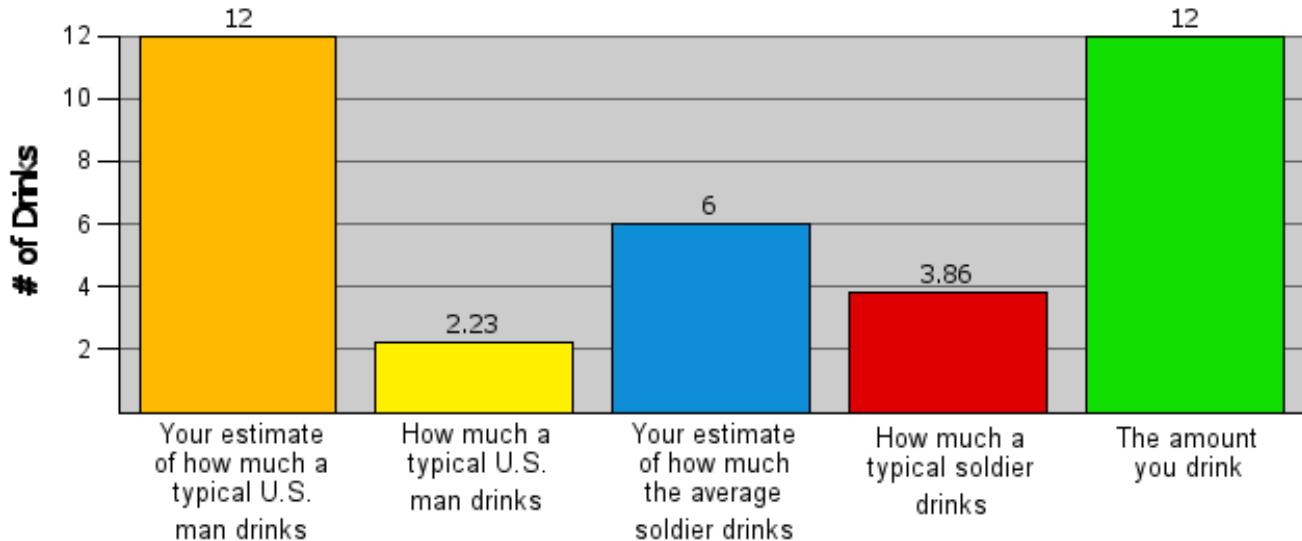
Alcohol Use

Drink Equivalents



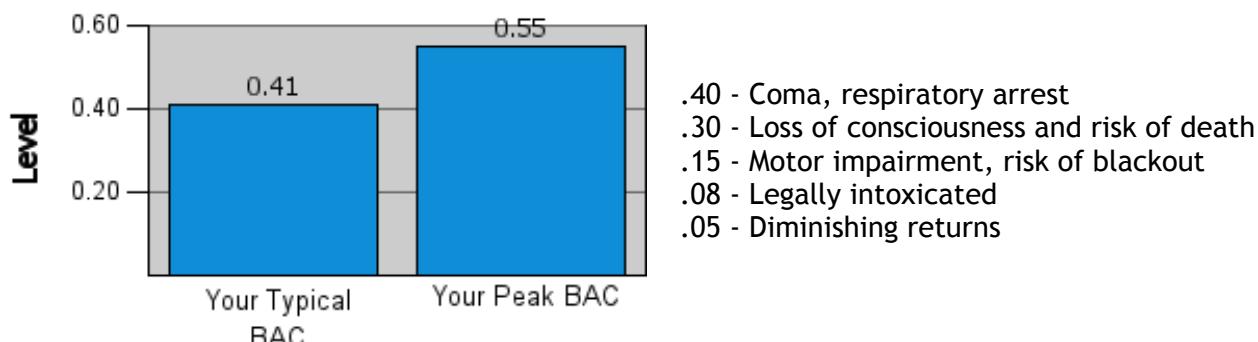
You reported drinking 80 drinks a week.

Average # of Drinks Each Occasion



Estimated Blood Alcohol Concentration

Average # of Drinks Each Occasion



Reasons You Drink Alcohol

What are some reasons you drink alcohol? How often do you drink for these reasons?

- no items reported

Consequences

You reported experiencing the following problems because of your **alcohol** use:

- I have been unhappy because of my drinking
- Because of my drinking, I have not eaten properly
- I have failed to do what is expected of me because of my drinking
- I have felt guilty or ashamed because of my drinking
- I have taken foolish risks when I have been drinking
- When drinking, I have done impulsive things that I regretted later
- My physical health has been harmed by my drinking
- I have had money problems because of my drinking
- My physical appearance has been harmed by my drinking
- My family has been hurt by my drinking
- A friendship or close relationship has been damaged by my drinking
- My drinking has gotten in the way of my growth as a person
- My drinking has damaged my social life, popularity, or reputation
- I have spent too much or lost a lot of money because of my drinking
- I have had an accident while drinking, intoxicated, or high



You reported experiencing the following **military specific** problems because of your **alcohol**:

- Did not get promoted
- Got a lower score of efficiency report or performance rating
- Called up during off duty hours and reported to work drunk
- Received Uniform Code of Military Justice punishment
- Spent time in jail, stockade, or brig
- Drop in Physical Training Score
- Other

Prescription Medications and Other Substances

You reported using the following drugs other than alcohol in the past 30 days:

- Sedatives
- Stimulants
- Opioids
- Cocaine
- Hallucinogens
- Inhalants
- Marijuana



How does your use of substances compare with others?

You told us you believed that on average 1% of soldiers used Sedatives in the past year.

The actual percentage of soldiers who have used Sedatives in the past year is %.

You told us you believed that on average 95% of men in the U.S. report use of Sedatives in the past year.

The actual percentage of men in the U.S. who report having used Sedatives in the past year is 0.3%.

Consequences

You reported experiencing the following problems because of your **substance use**:

- I have been unhappy because of my drug use
- Because of my drug use, I have not eaten properly
- I have failed to do what is expected of me because of my drug use
- I have felt guilty or ashamed because of my drug use
- I have taken foolish risks when I have been using drugs
- When using drugs, I have done impulsive things that I regretted later
- My physical health has been harmed by my drug use
- I have had money problems because of my drug use
- My physical appearance has been harmed by my drug use
- My family has been hurt by my drug use
- A friendship or close relationship has been damaged by my drug use
- My drug use has gotten in the way of my growth as a person
- My drug use has damaged my social life, popularity, or reputation
- I have spent too much or lost a lot of money because of my drug use
- I have had an accident while intoxicated or high



You reported experiencing the following military specific problems because of your **drug use**:

- Did not get promoted
- Got a lower score of efficiency report or performance rating
- Called up during off duty hours and reported to work high
- Received Uniform Code of Military Justice punishment

- Spent time in jail, stockade, or brig
- Drop in Physical Training Score
- Other

Money Spent \$\$\$...

In a typical month, you spend about \$800 on alcohol.

In a typical month, you spend about \$1000 on cocaine.

Mental Health: Military Stress

You reported the following Military Stress symptoms:

Extremely

- Feeling distant or cut off from other people
- Feeling emotionally numb or being unable to have loving feelings for those close to you
- Feeling as if your future will somehow be cut short
- Trouble falling asleep or staying asleep
- Feeling irritable or having angry outbursts
- Having difficulty concentrating
- Being "super-alert" or watchful or on guard
- Feeling jumpy or easily startled

Quite a Bit

- Repeated, disturbing memories, thoughts, or images, of the stressful experience
- Repeated, disturbing dreams of the stressful experience
- Suddenly acting or feeling as if the stressful experience was happening again (as if you were reliving it)
- Avoiding thinking about or talking about the stressful experience or avoiding having feelings related to it
- Avoiding activities or situations because they reminded you of the stressful experience
- Trouble remembering important parts of the stressful experience
- Loss of interest in activities that you used to enjoy

Moderately

- Feeling very upset when something reminded you of the stressful experience
- Having physical reactions (e.g., heart pounding, trouble breathing, sweating) when something reminded you of the stressful experience

What is your risk for developing military stress?

High

Summary Risk Factors

Tolerance Level

Very High

Other Drug Risk

Very High

Family History

Very High

Mental Health

Very High



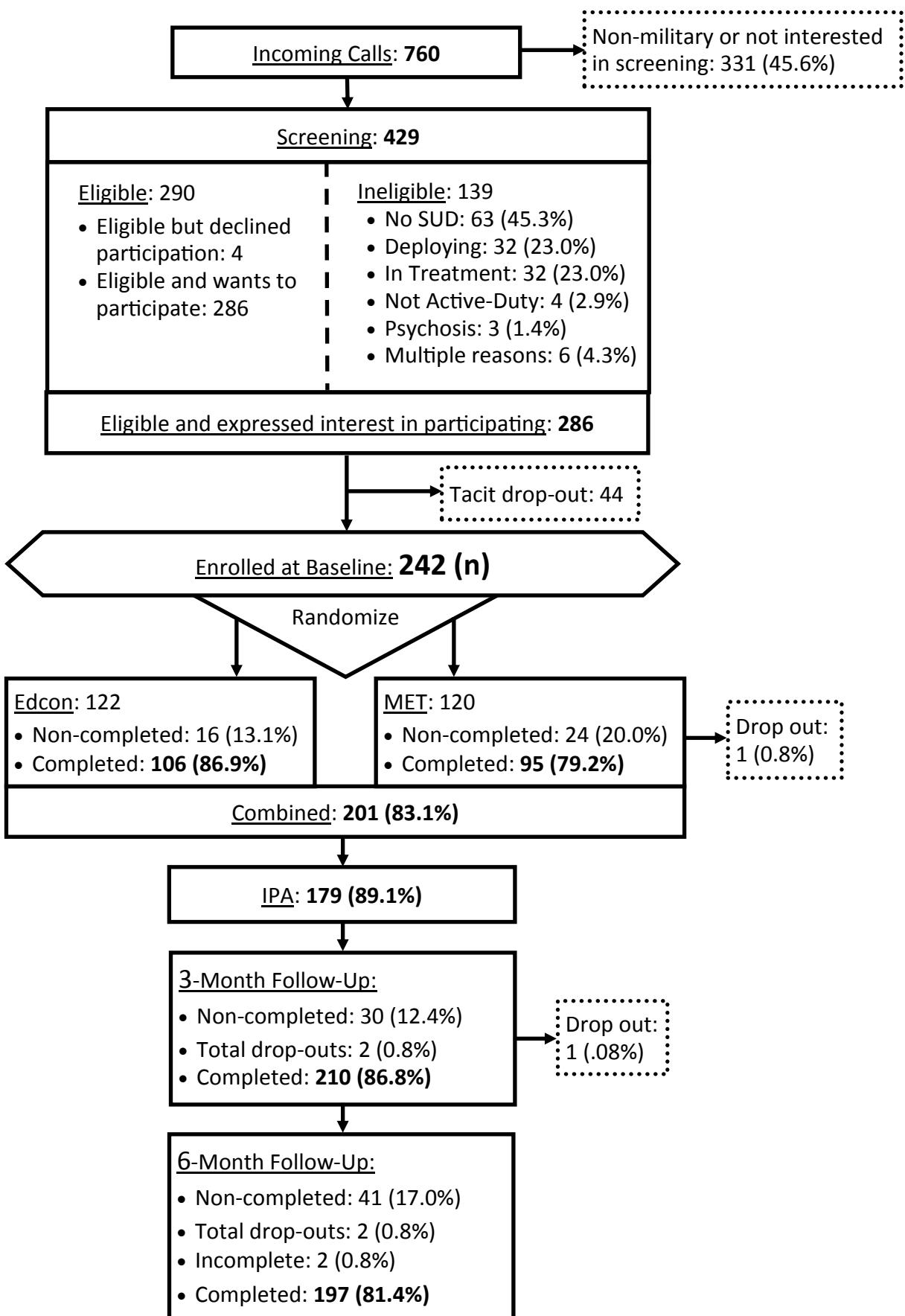


Life Goals



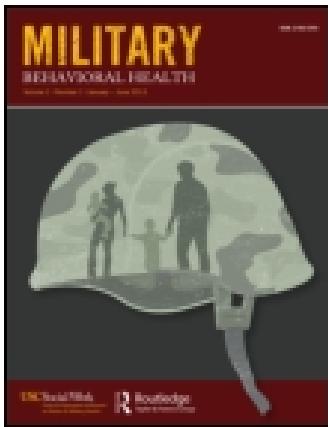
My Goals	My use affects this goal:	Reducing my use would affect this goal:
1) Date a model	Negatively	Positively
2) go to Vegas	Negatively	Very Positively
3) bench press 300	Very Negatively	Positively
4) become a professional wrestler	Negatively	Positively
5) meet Arnold Schwartneger	Neutral	Neutral

Warrior Check-Up: Participation Flow



Motivating Treatment Engagement among active duty Army personnel with co-morbid substance abuse disorder and PTSD: Applications from the Warrior Check-Up

The Warrior Check-Up is a randomized clinical trial to develop and evaluate a Motivational Enhancement Therapy (MET) intervention for active-duty Army personnel with untreated substance use disorder (SUD). This ongoing Department of Defense funded study will recruit 240 participants over three years. A one session MET is being compared to psychoeducation. This talk will describe the concept of the Warrior Check-Up for attracting voluntary participation from untreated substance abusers and the current baseline sample with regard to substance use and PTSD variables. Though recruiting subjects on the basis of SUD, of the first 97 participants to complete baseline, 81% showed significant PTSD symptoms (≥ 28 on PCL). Soldiers with this level of symptomatology were more likely to meet DSM criteria for alcohol and drug dependence (insert stats). Preliminary data suggest a decline in PTSD symptoms from baseline to follow-up (insert stats). This talk will also discuss treatment engagement; applying and adapting Motivational Enhancement Therapy with trauma-exposed non-treatment-seeking Soldiers; and the use of feedback on PTSD symptoms incorporated into the MET session as a motivator for change.



Military Behavioral Health

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Normative Misperceptions of Alcohol Use Among Substance Abusing Army Personnel

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Normative Misperceptions of Alcohol Use Among Substance Abusing Army Personnel

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This research examines discrepancies among perceived norms, actual norms, and own behavior for alcohol in the military. Participants included 159 substance-abusing, active-duty U.S. Army personnel. Participants' estimates of the average number of drinks consumed by Army personnel were significantly higher than the actual norm. Participants also overestimated the percentage of Army personnel who have engaged in heavy episodic drinking relative to the actual percentage. Participants' own drinking was associated with their overestimations of other military personnel drinking but not other civilian drinking. Results provide foundational support for the use of military-specific normative feedback as a potential intervention strategy.

Keywords: Social norms, drinking, Army, intervention, military, alcohol, social influence, misperception, substance use, active duty

ALCOHOL USE IN THE MILITARY

Alcohol use has long been an established part of military culture (Ames, Duke, Moore, & Cunradi, 2009; Bray et al., 2009; Institute of Medicine, 2012). Alcohol use and related problems are more prevalent within the military than rates found in the civilian population and among other high-risk

civilian populations, such as college students (Ames & Cunradi, 2004/2005; Eisen et al., 2012). Of those in the military, younger service members are at the highest risk for alcohol use and problems (Bray et al., 2009; Institute of Medicine, 2010; Jacobson et al., 2008; Lande, Marin, Chang, & Lande, 2008; Stahre, Brewer, Fonseca, & Naimi, 2009). For example, the most recent military-wide survey of health-related behaviors found that 32% of soldiers aged 21 to 25 were heavy drinkers compared to 22% of soldiers of all ages and 16% of same-age civilians (Bray et al., 2009). During a 12-month period, more than one-fifth of junior enlisted personnel experienced serious consequences from alcohol use,

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including military punishment or alcohol-related arrest (Ames & Cunradi, 2004/2005; Bray et al., 2009). In addition, studies of military populations have found that excessive alcohol use is associated with poor job performance and increased rates of suicide, homicide, domestic violence, post-traumatic stress disorder (PTSD), and depression (Eisen et al., 2012; Institute of Medicine, 2012; Martin et al., 2010).

SOCIAL NORMS AND DRINKING

In the most general use of the term, social norms refer to perceived or actual standards of expectations, attitudes, or behavior (Sherif, 1936). One type of social norm, distinguished by Cialdini and colleagues (Cialdini, 2012; Cialdini, Kallgren, & Reno, 1991), is a descriptive norm, which usually refers to the prevalence of a given behavior. Actual descriptive norms refer to actual behavior (e.g., typical number of drinks per occasion among Army personnel), whereas perceived norms refer to an individual's perception of the descriptive norm (e.g., an individual's estimate of the typical number of drinks per occasion among Army personnel). This is not a trivial distinction, given that in other populations, including college students and the general population, research has shown a tendency for individuals to overestimate descriptive drinking norms (Borsari & Carey, 2003; Cunningham, Neighbors, Wild, & Humphreys, 2012; Perkins, 2007). Furthermore, it is the perception of the norm, rather than the norm itself, which is most likely to influence behavior. Indeed, perceived descriptive norms are among the strongest predictors of drinking among young adult, heavy-drinking college students (Neighbors, Lee, Lewis, Fosso, & Larimer, 2007). These findings have been instrumental in the development of empirically supported, brief, computer-delivered personalized normative feedback interventions in the college student population (e.g., Lewis & Neighbors, 2007; Neighbors, Larimer, & Lewis, 2004; Neighbors, Lewis et al., 2010). The same patterns identified among military personnel would provide a theoretical foundation for a potentially cost-effective, web-based brief intervention among military personnel.

Heavy drinking has been thought of as part of military life from the inclusion of rum rations in the British Royal Navy to leave time where drinking rates are often elevated (Federman, Bray, & Kroutil, 2000; Standage, 2005). Military culture has emphasized drinking as a means for group bonding, recreation, and stress relief (Ames, Cunradi, Moore, & Stern, 2007). Alcohol is typically easy to access both on and off base, is inexpensive, and is easy to obtain in base exchanges and commissaries (Moore, Ames, & Cunradi, 2007). Not surprisingly, active-duty military attitudes reflect these perceptions. For example, 38.5% of heavy drinkers in the military reported drinking because it was part of being in the military, as compared to 10% of light drinkers (Bray et al., 2009). Heavy drinkers also endorsed strong beliefs that drinking was the only recreation available (23.1%), that they had been encouraged to drink at parties (21.1%), and that leadership was tolerant of off-duty intoxication (31.3%; Bray et al., 2009).

Military personnel may also have greater exposure to elevated social norms regarding drinking due to increased time with peers who model drinking behavior, which in turn may inflate perceptions of military drinking. In such communities as the military where individuals work, live, and socialize together this can lead to close-knit groups and behavioral norms, which may further influence consumption (Ames et al., 2009; Bray, Bae, Federman, & Wheless, 2005). Researchers have just begun to examine the role of social norms in understanding drinking behaviors in the military. In active-duty military, Williams, Herman-Stahl, Calvin, Pemberton, and Bradshaw (2009) found that perceiving same-age, active-duty military personnel to drink more was associated with more drinking days and heavy-episodic drinking occasions at one- and six-month follow-up assessments. Bray and colleagues (2009) found that alcohol consumption is positively correlated with beliefs about supervisors' drinking and that one-quarter of heavy-drinking military personnel believe that others at their installation and at their pay grade believe it is acceptable to drink to the point of "losing control." Furthermore, Ames and colleagues (Ames et al., 2007; 2009) have found perceived norms to be significantly associated with heavy drinking among Navy careerists and Navy enlistees.

It is unknown to what extent military or civilian norms are better predictors of drinking among military personnel. Social identity theory (SIT; Tajfel & Turner, 1986) provides a theoretical framework for understanding the role of normative salience in the influence of social norms (Tajfel & Turner, 1986). Several studies have shown that normative perceptions of more proximal groups (e.g., same-sex peers, close friends), in comparison to more distal groups (e.g., typical students), are more strongly associated with alcohol use (Larimer et al., 2009). Military training is designed to build identification with the military itself and with the members of one's unit, which may intensify the role of identification and the role of drinking norms in this population (Griffith, 2009; Siebold, 2007).

CURRENT STUDY

The present research was designed to evaluate whether discrepancies between actual and perceived drinking norms exist among military personnel. We were also interested in examining whether discrepancies were similar for military-specific versus civilian drinking norms. Furthermore, we were interested in evaluating whether military-specific perceived norms would be more strongly associated with drinking relative to perceived civilian norms.

METHOD

Participants and Procedure

The following analysis stems from the Warrior Check-Up, a Department of Defense–funded randomized clinical trial of a brief telephone-delivered intervention for soldiers with an

untreated substance use disorder. Participants were screened from 538 callers who responded to various forms of advertising media including newspaper ads, print media distributed throughout the military base, presentations at briefings, and referrals from professionals and friends. Advertisements offered soldiers a confidential opportunity to participate in research and to speak with a civilian counselor about their alcohol- or drug-use concerns (for analysis of recruitment procedures, see Walton et al., 2013). Recruitment occurred between 2010 and 2013 at a large base in the Pacific Northwest. All procedures were approved by the university institutional review board and the appropriate military institutional review board.

After a brief discussion establishing informed consent, interested callers completed a confidential screening phone call to determine eligibility to participate in the project. Eligibility criteria included current active-duty status in the Army; abuse or dependence on alcohol, drugs, or prescription medications in the past 90 days; fluency in English; no evidence of psychosis; and not currently participating in substance abuse treatment. Substance abuse and dependence diagnoses were assessed using the Psychoactive Substance Use Disorders section of the Structured Clinical Interview for *DSM-IV* (SCID; First, Spitzer, Gibbon, & Williams, 1995). The SCID was developed to improve interrater diagnostic reliability; Kappas for substance abuse/dependence disorders have typically ranged from .75 to .84.

Eligible callers who completed the screening process were scheduled to complete a baseline assessment by telephone. Participants had the right to refuse to answer any or all questions. Of the 304 callers who completed screening, 159 were found eligible to participate in the study and completed a baseline assessment for the larger intervention trial. Data for the present study were taken from this baseline assessment. The 159 participants identified their race as follows: Caucasian (57.2%), African American (17.0%), Asian/Asian American (1.9%), American Indian (0.6%), and multiracial or otherwise racially identified (18.7%). In addition, 15.7% of the respondents were Hispanic. The age distribution of participants was 18 to 25 (45.3%), 26 to 30 (28.3%), 31 to 40 (20.1%), 41 and up (6.3%). Lower-ranking enlisted soldiers (E1 through E4) comprised 54.8% of the sample, with non-commissioned officers (E5 through E8) at 39.4%, and officers (O1 through O6) at 5.8%. The sample was also predominately male (91.2%). Eligible callers were demographically similar to ineligible callers.

Measures

Alcohol Consumption

Alcohol use was assessed with the Daily Drinking Questionnaire (DDQ) and the Quantity-Frequency scale (QF; Collins, Parks, & Marlatt, 1985; Dimeff, Baer, Kivlahan, & Marlatt, 1999). The DDQ asks participants to think about a typical week and estimate the typical number of drinks

they consume on each day of the week over the past month. Responses for each day of the week are summed to provide a score for the average number of drinks consumed per week. Three items were also included to assess frequency, typical drinking, and peak drinking. Frequency was assessed by an item asking participants how many days per week they typically consumed alcohol over the past month. Typical drinking was assessed by asking participants the average number of drinks consumed during a typical occasion in the past month. Finally, peak drinking was assessed by asking participants the number of drinks consumed on their heaviest drinking occasion in the past month.

Perceived Norms

Perceived norms were assessed using a modified version of the Drinking Norms Rating Form (Baer, Stacy, & Larimer, 1991; Dimeff et al., 1999). This questionnaire was constructed to mirror the DDQ but assessed perceptions of others' drinking rather than one's own drinking. Perceived norms were assessed for both military personnel and civilians. Thus, participants were asked: "Consider a typical week during the past 30 days. How much alcohol (measured in number of drinks) do you think the average person in the Army drinks on each day of a typical week?" Responses for each day of the week were summed to provide a score for the perceived norms for drinks per week (military). Items also assessed perceived norms for frequency, typical drinking, and peak drinking in the Army mirroring items from the DDQ described. Perceived norms were asked using the same format with respect to civilian individuals.

Base Rate Norms for Active-Duty Army Personnel and Civilians

Military norms were created based on the 2005 Department of Defense Survey of Health Related Behaviors (SHRB), whose participants were selected to represent active-duty personnel from all branches, ranks, and basic demographic variables. Data were collected using an anonymous self-administered questionnaire. Results from the 3,639 Army respondents were weighted to represent all active-duty soldiers.

Data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC, 2001) study provided the civilian population norms. Collected between 2001 and 2002 from 43,093 noninstitutionalized U.S. households, these data were also weighted to provide a nationally representative sample (Grant, Kaplan, Shepard, & Moore, 2003). Military families were excluded from the data set when calculating civilian norms. Prior research has used NESARC data to calculate the actual norms given in normative feedback (Chan, Neighbors, Gilson, Larimer, & Marlatt, 2007). Both studies report the average ounces of daily ethanol intake, which was

divided by 0.5 to convert the variable to number of “drinks” per day (0.5 ounces of ethanol per drink).

Analysis Strategy

The evaluation of accuracy of perceived norms for drinking were based on the typical number of drinks per occasion among Army personnel ($M = 3.86$; Bray et al., 2006) and in the general population ($M = 1.69$; Chan et al., 2007; NESARC, 2001). Number of drinks per typical drinking occasion was used to evaluate accuracy, given its practical applicability in constructing normative feedback and the availability of actual norms for both military and general populations. One-sample t tests were used in comparing these norms with participants’ own behavior and perceptions. Independent samples t tests were used to compare participants’ behavior with their perceptions. Effect sizes for one-sample t tests (Cohen’s d) were calculated by taking the differences between the mean of the perceived norm and the estimated population value divided by the standard deviation of the perceived norm (Cohen, 1988). For independent sample t tests and tests of regression parameter estimates, effects sizes (d) were calculated using the formula $d = 2t/df$ (Rosenthal & Rosnow, 1991). Effect sizes of .20, .50, and .80 are considered small, medium, and large, respectively (Cohen, 1992).

RESULTS

Inaccuracy of Perceived Norms in Military and Civilian Populations

Results showed that participants’ estimates of typical number of drinks per occasion among Army personnel ($M = 5.52$, $SD = 2.95$) were significantly higher than the actual norm ($M = 3.86$), $t(156) = 7.01$, $p < .001$, $d = .56$. Similarly, participants’ estimates of typical number of drinks per occasion in the general population ($M = 4.59$, $SD = 2.43$) were significantly higher than the actual norm ($M = 1.69$), $t(156) = 16.61$, $p < .001$, $d = 1.19$. Thus, participants overestimated drinking norms regarding typical number of drinks for both military and civilian populations.

In comparison, their own typical number of drinks per occasion ($M = 5.39$, $SD = 3.35$) did not differ from their perceptions of the average number of drinks per occasion among Army personnel, $t(155) = -.51$, $p = .61$, $d = .08$. In contrast, their own typical number of drinks per occasion was higher than their perceptions of typical drinking among civilians, $t(155) = 2.92$, $p = .004$, $d = .47$, and higher than the actual norms for Army personnel, $t(154) = 5.67$, $p < .001$, $d = .91$, and civilians, $t(155) = 14.09$, $p < .001$, $d = 2.26$. Thus, participants believed that their typical number of drinks consumed was similar to other military personnel but higher than civilians. Figure 1 presents means and standard errors for perceived norms relative to actual estimates.

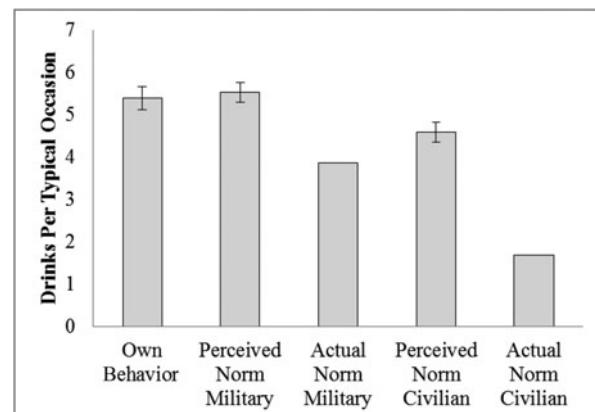


FIGURE 1 Means and standard errors of self-reported number of drinks per typical drinking occasion compared with perceived and actual norms among the military and civilian populations.

Comparisons Between Own Drinking and Perceived Norms in Military and Civilian Populations

Although actual norm estimates were not available for additional drinking outcomes in both military and civilian populations, we were interested in how participants’ own drinking related to their perceived norms for other drinking outcomes (i.e., drinks per week, drinking frequency, and number of drinks on the peak occasion) and whether the pattern for these outcomes was similar to typical drinks per occasion described.

Figure 2 graphically presents means and standard errors for participants’ own drinking, perceived norm for the

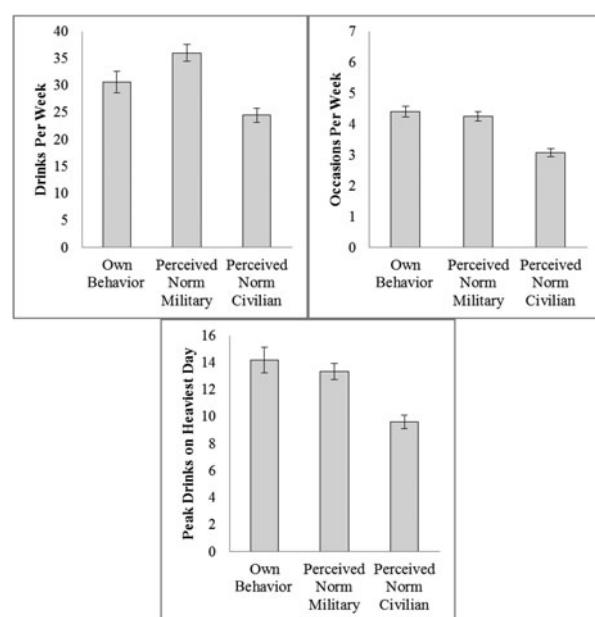


FIGURE 2 Means and standard errors of own drinking and perceived norms among the military and civilian populations on drinks per week, number of drinking occasions per week, and number of peak drinks on heaviest drinking day.

TABLE 1
Perceived Norms and Own Drinking for Drinks per Week, Frequency and Peak Drinks

Criterion	Perceived Norm: Military		Perceived Norm: Civilian		Own Behavior	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Drinks per week	36.03	20.08	24.48	16.31	30.67	24.76
Drinking frequency	4.25	1.88	3.08	1.69	4.40	2.23
Peak drinks	13.34	7.66	9.60	6.02	14.19	11.71

military, and perceived norm for the civilian population on three drinking outcomes: drinks per week, drinking frequency, and number of drinks on the peak occasion in past month. Means and standard deviations are presented in Table 1. Paired-samples *t* tests revealed similar patterns across drinking outcomes.

Participants generally perceived drinking norms among the military to be similar to their own drinking. Their own behavior was not significantly different from perceived military norm for drinking frequency, $t(154) = 0.84$, $p = .40$, or peak number of drinks in the past month, $t(150) = 0.90$, $p = .37$. For drinks per week, own behavior was lower than the perceived military norm, $t(154) = -2.41$, $p = .02$.

In contrast, participants' own behavior was significantly higher than the perceived civilian norm for drinks per week, $t(152) = 2.77$, $p = .006$, drinking frequency, $t(153) = 6.15$, $p < .001$, and peak drinks in the previous month, $t(148) = 4.45$, $p < .001$. There was also a consistent pattern indicating that perceived military norms were higher than perceived civilian norms for drinks per week, $t(152) = 7.66$, $p < .001$, drinking frequency, $t(154) = 7.38$, $p < .001$, and peak number of drinks, $t(152) = 6.17$, $p < .001$. In sum, the pattern of results for these outcomes appeared to follow the same pattern observed for typical drinks per occasion.

Associations Between Perceived Norms and Drinking Behavior

Table 2 includes regression results examining own drinking as a function of perceived military norms and perceived civilian norms for drinks per week, drinking frequency, drinks per typical occasion, and peak number of drinks in the past month. Norms among the military predicted own drinking in all four drinking outcomes (average $d = .54$), whereas norms among civilians did not uniquely predict own drinking in three of the four drinking outcomes (average $d = .10$).

DISCUSSION

The focus of the present study was to examine the perceptions that Army personnel have about civilian and Army peers' drinking behavior and to evaluate the relationship of these beliefs on one's own drinking behavior. This can assist in evaluating the potential utility of providing social norms feedback to military personnel. Social norms feedback is an important component to many brief interventions (e.g., motivational enhancement therapy, social norms campaigns) and has been studied as a stand-alone intervention with college students (Doumas, Kane, Navarro, & Roman, 2011; Lewis & Neighbors, 2007; Lojewski, Rotunda, & Arruda, 2010; Neighbors et al., 2004; Neighbors, Lewis et al., 2010). Normative feedback has recently been incorporated into computerized interventions for military populations (Pemberton et al., 2011; Simon-Arndt, Hurtado, & Patriarca-Troyk, 2006), yet studies have not reported the isolated effects of such feedback on drinking behavior. Because alcohol abuse is now considered to be a public health crisis in the military (Institute of Medicine, 2012), identifying effective methods of prevention and intervention are of high importance, and social norms feedback is one viable option.

Findings indicated that Army personnel grossly overestimate how much civilians and other soldiers drink. They

TABLE 2
Self-Reported Drinking as a Function of Perceived Norms Among the Military and Among Civilians

Criterion	Predictor	<i>b</i>	<i>t</i>	β	<i>p</i>	<i>d</i>	<i>R</i> ²
Drinks per week	Military norm	.33	2.83	.263	.005	.464	.063
	Civilian norm	-.04	-.28	.026	.781	-.046	
Drinking frequency	Military norm	.403	4.04	.341	<.001	.658	.105
	Civilian norm	-.06	-.55	-.046	.584	-.090	
Peak drinks	Military norm	.32	2.39	.213	.018	.396	.074
	Civilian norm	.18	1.11	.099	.269	.184	
Drinks per typical occasion	Military norm	.36	3.88	.313	<.001	.634	.165
	Civilian norm	.23	2.05	.165	.042	.335	

believe that they drink about the same as other people in the Army but more than others in the general population. In three of four outcomes, only perceptions of other Army personnel were found to be uniquely related to their own drinking. The more they believed other soldiers drank, the more they reported drinking themselves.

Theoretical requirements for effective normative feedback interventions require that there be a normative misperception to correct and that the norms be associated with one's own drinking behavior. In this case, both requirements appear to be met for military norms but not civilian norms. Participants' own drinking was associated with their perceptions of typical drinking among other Army personnel, but their perceptions were not correct. In fact, they overestimated how much other Army personnel consume on a typical occasion. Moreover, to the extent that soldiers base their own drinking on misperceptions of what is typical among their Army peers, correction of these misperceptions may reduce their drinking.

These results are important because they suggest that if normative interventions are to be used with Army personnel, the normative feedback provided should rely on military rather than civilian data. Work based on social identity theory with college students similarly suggests that associations between perceived norms and one's own drinking are stronger for groups with which one identifies more closely (Neighbors, LaBrie et al., 2010; Reed, Lange, Ketchie, & Clapp, 2007). Indeed, the fact that perceived norms for other Army personnel were uniquely associated with one's own drinking, but perceived civilian norms were not, suggests that identification with other Army personnel may be an important variable to consider. Further research might also consider the potential utility of specific norms such as using data at the unit level or by job (such as military police or special forces) within the military. It is likely that specific beliefs are formed around typical drinking behavior by soldiers who employ certain jobs or possibly by rank within the military, and these perceptions differ based on the characteristics of the soldier. This suggestion is underscored by data indicating that drinking in the military is heaviest among individuals who are lower rank, have less education, and are usually younger than 35 (Bray, Bae, Federman, & Wheless, 2005). These findings also suggest that universal prevention strategies aimed at lowering overall drinking misperceptions among Army personnel may be beneficial to pursue as a potential intervention strategy.

Several limitations should be recognized in consideration of these findings. These data were cross-sectional and limit our ability to draw causal inference regarding perceived norms and behavior. Further, the study sample was composed of Army personnel who met criteria for a substance abuse or dependence disorder, were not engaged in substance abuse treatment, and volunteered for a research study as an opportunity to "take stock of their drinking and consider their options." Although participants were not engaged in treat-

ment for substance abuse, the fact that they met criteria for a substance use disorder limits the extent to which the findings may be generalized to the Army as a whole. Future research may extend this paradigm to examine how findings might be different in a nonclinical sample or among social drinkers. Nevertheless, implementation of social norms-based interventions is most likely to be useful among heavier drinkers, and this research provides a preliminary foundation for such an approach. In addition, social identity theory posits that the most important influences in guiding drinking behavior are also the most personally proximal. As age was not included in the assessment of norms and drinking behaviors, future research may also wish to consider proximity in age and developmental life stage of the social reference group when considering one's own drinking behavior and estimates of others' drinking behavior as well.

This study represents an important step for establishing normative feedback as a stand-alone intervention in the military. This approach has been used extensively in college populations and might be readily adapted for the military, offering a brief, low-cost intervention approach that can be delivered online to a large proportion of soldiers. This research provides empirical evidence supporting the theoretical foundation for this approach in the Army population, thereby suggesting the potential for this approach to be successful.

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Spicing up the Military: Use and Effects of Synthetic Cannabis in Substance Abusing Army Personnel

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RUNNING HEAD: SYNTHETIC CANNABIS USE IN THE US ARMY

Spicing up the Military:
Use and Effects of Synthetic Cannabis in Substance Abusing Army
Personnel

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KEY WORDS: Spice; synthetic cannabis; military; substance abuse; Army

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Abstract

Synthetic cannabis (SC) use has been increasing within the United States. Due to difficulties with its detection through standard testing, it may be an attractive substance of abuse for military personnel. However, few studies have examined the consequences of its use in this population, including evidence for its potential for abuse and dependence. Participants included 368 active-duty Army personnel who expressed interest in participating in a “check-up” around their alcohol or substance use, of whom 294 (80%) met DSM-IV criteria for substance abuse or dependence (including alcohol, illicit drugs, and prescription medications) and were not engaged in substance abuse treatment. Forty-one participants (11%) reported using SC in the last 90 days. Of those, 27 listed SC as their drug of choice. There were no significant differences in race, ethnicity, deployment history, or religion between SC users and others. Users of SC were generally younger and had less education and income than those who used only alcohol. Among SC users, 12% met criteria for drug abuse and 68% for dependence. Participants perceived SC use to be significantly more prevalent among military personnel than among civilians. Results suggest that SC is prevalent among substance-using soldiers and that DSM-IV criteria for abuse and dependence apply to SC. In addition, results highlight the importance of assessing and treating SC use among active-duty military personnel.

KEYWORDS: emerging drugs; Spice; designer drugs; substance abuse; synthetic cannabis; synthetic marijuana; military

ACCEPTED MANUSCRIPT

Introduction

A 2012 Institute of Medicine report urged the Department of Defense to “acknowledge that the current levels of substance use and misuse among military personnel and their dependents constitute a public health crisis” (p.6, IOM, 2012). The report also recognized that a new class of synthetic substances including synthetic cannabis (SC) poses unique new challenges for military public health authorities. Synthetic cannabis, also known by the brand names “Spice”, “K2” and “Bliss” contains shredded plant material coated with chemicals manufactured to mimic THC - the psychoactive compound in marijuana (Auwärter et al., 2009). The substance remains in a legal grey area that varies across jurisdictions, yet it remains available for purchase online, in the black market, and in some retail establishments where it is labeled as “potpourri” or “incense.” Entering the market around 2008, empirical analysis of the drug and its effects is an emerging area of interest across disciplines.

Early in 2011, shortly after recruitment for the present study began, the US Drug Enforcement Administration listed several of the main compounds found in SC as schedule 1 substances, making their production and sale illegal (Harris & Brown, 2013). At the same time, the Board of Pharmacy in Washington State, where the study recruited, took the same action to ban SC (Washington State Department of Health, 2010). Then, in 2012, the Synthetic Drug Abuse Prevention Act expanded the list of prohibited compounds used in SC. However, as rapidly as legislation bans specific subsets of the compounds (JWH-018 for example), producers sidestep regulation by synthesizing alternative cannabinoid molecules not listed in existing laws (Hughes,

2012). The Federal Analog Act of 1986 was designed to control this process of evasion in response to earlier designer drugs; however, poorly defined standards and a scarcity of case law have weakened its enforceability (Kau, 2008). Though now more difficult to obtain, SC remains available to those who wish to use it.

Qualitative studies have illustrated that a primary reason for its use among college students and the general public is that SC is perceived to be largely undetectable in standard drug screens used by employers and the criminal justice system (Perrone, 2013; Schifano et al, 2009). The difficulty in testing, paired with over-the-counter availability, may understandably make SC an attractive drug for soldiers who want to minimize their risk of detection while still experiencing an intoxication effect similar to marijuana. Observing this trend of SC use among soldiers, the US military issued a ban on SC in each of its branches, with the Army's rule being issued in February of 2011 (DoD, 2011, Vardakou, Pistros, & Spiliopoulou, 2010). Additionally, the Army recently added SC to the random drug urinalysis panel (Army Substance Abuse Program, 2013), the Army's primary method of drug detection. However, it remains difficult to reliably detect SC use. Just as authorities struggle to ban an ever-changing set of compounds, urinalysis producers struggle to develop reliable tests (Gunderson, Haughey, Ait-Daoud, Joshi & Hart, 2012; Seely et al, 2012).

While little is still known about SC and its health consequences, there have been numerous case studies from emergency departments reporting a wide range of adverse effects. These include seizure, convulsion, nausea, vomiting, and cardiovascular and respiratory problems (Forrester, Kleinschmidt, Schwarz, & Young, 2011; Jinwala &

Gupta, 2012; Schneir and Baumbacher, 2012; Simmons, Cookman, Kang & Skinner, 2011;). Adverse psychological effects may include anxiety, confusion, agitation, irritability, depressed mood, and memory changes (Bebarta, Ramirez, & Varney, 2012; Schneir, Cullen & Ly, 2011; Castellanos, Sing, Thornton, Avila & Moreno, 2011; Simmons et al., 2011; Seely et al, 2012). Synthetic cannabis consumption also may have triggered brief or lasting onset of psychosis (Hurst, Loeffler, & McLay, 2011), with individuals that have histories of mental illness potentially at higher risk (Every-Palmer, 2010).

While these health effects are similar to consequences of marijuana consumption, some evidence suggests that SC is an even stronger agonist of the CB1 and CB2 cannabinoid receptors. Harris and Brown (2013) report that JWH-018, the original compound found in SC, has a four-fold affinity for the CB1 receptor and a ten-fold affinity for CB2 when compared to THC. CB1 affects mood elevation, anxiety and panic, while CB2 affects immune tissue, emesis and inflammatory response. While further analysis is needed, the potential for greater health effects related to this higher potency is noteworthy. Additionally, as producers introduce novel variants, potency and effects will remain uncertain.

Beyond anecdotal evidence suggesting SC is attractive to individuals who undergo routine drug testing and case reports discussing the medical effects on users presenting in emergency departments, little is known about the psychological correlates and consequences of SC use. Nor is it currently known to what extent SC has potential for abuse and dependence. The present study addresses some of these gaps. Further,

as drug use among service members is of great concern to the military, and SC has thus far evaded assured detection, this study provides some data on how this drug may be impacting Army personnel.

The Warrior Check-Up (WCU), the parent project of the current study, is a randomized clinical trial of a brief telephone-based motivational enhancement intervention for substance-using US Army soldiers. Employing a check-up model approach (Walker, Roffman, Picciano, & Stephens, 2007), the intervention uses social marketing to attract soldiers who are abusing or dependent upon alcohol or other drugs, but are ambivalent about changing behavior.

Synthetic cannabinoids quickly emerged as a prevalent issue for participating soldiers. Accordingly, protocols and measures were adapted within the first six months of recruitment to include an investigation of their use. The present study uses baseline data from WCU to explore prevalence of use and characteristics of soldiers who are attracted to the drug in terms of demographics, mental health indicators, and use of other substances. Finally, with alcohol we know that perceived social norms of use impact individuals' own drinking behavior. Moreover, normative misperceptions have been an effective point of intervention for populations similar to that of the WCU (Pemberton, et al., 2011; Williams, Herman-Stahl, Calvin, Pemberton & Bradshaw, 2009). Therefore, we were also interested in examining soldiers' perceptions of SC use among relevant referent groups relative to other substances.

Methods

Participants and procedures

Participants included 368 active-duty Army personnel stationed at a large post in the Pacific Northwest who completed a screening assessment for a larger study that included measures of substance use. Of these, 294 met criteria for substance abuse or dependence (including alcohol, illicit drugs, and prescription medications). Eligible callers were invited to participate in a longitudinal trial and complete a more extensive baseline assessment including measures of perceived norms, depression, anxiety and additional demographic data. Eligibility requirements included: abuse or dependence on alcohol, drugs, or prescription medications; active-duty military status; no evidence of psychosis; no current engagement in substance abuse treatment; and no planned deployment to a combat zone within the next seven months.

The enrolled sample (N=199) included 8.0% women and the racial composition was 57.3% Caucasian, 17.1% African American, and 25.6% who endorsed one or more other categories (i.e., American Indian, Asian, Native Hawaiian, other, or refused). Sixteen percent of participants indicated a Hispanic identity. Most participants (77.6%) had been deployed at least once. Of participants who provided their rank, most were enlisted (93.2%), and 6.8% were commissioned or warrant officers. Nearly half the sample (45.0%) had been in the military for four years or less, 33.3% had served between five and eight years, 11.6% between nine and twelve years, and 10.1% had served more than twelve years.

Measures

Substance use. The *Customary Drinking and Drug Use Record (CDDR)*) was developed to assess current (past 3 months) and lifetime use of alcohol and drugs. This measure was adapted to include SC. The CDDR has demonstrated good psychometric properties with young and middle-age adults (Brown et al., 1998).

The *Psychoactive Substance Use Disorders* section of the *Structured Clinical Interview for DSM- IV* (SCID) served to assess abuse and dependence diagnoses. The SCID was developed to improve inter-rater diagnostic reliability and kappas for substance abuse/dependence disorders typically range from .75 to .84 (First, Spitzer, Gibbon, & Williams, 1995).

The *Short Inventory of Problems* was adapted to assess 22 negative consequences related to substance use. Six military specific items were added to the measure, including, for example, “I had a drop in my Physical Training Score because of drinking or drug use” (Forcehimes, Tonigan, Miller, Kenna, & Baer, 2007).

Mental health. PTSD Symptoms were assessed using the *PTSD Checklist – Specific version (PCL-S)*. This 17-item questionnaire assesses Criteria B, C, and D of the PTSD construct consistent with the DSM-IV (American Psychiatric Association, 2000). Participants rated how much they were bothered in the past month by each symptom on a 5-point scale ranging from “(1) not at all” to “(5) extremely.” The PCL has high correlations (0.92) with the *Clinician Administered PTSD Scale*, the gold-standard diagnostic measure of PTSD. Cronbach’s alpha for the PCL-S was found to be high

(0.97; Blanchard, Jones-Alexander, Buckley & Forneris, 1996; Weathers et al., 1993; Weathers, Litz, Huska & Keane, 1994).

The Patient Health Questionnaire Module (PHQ-9) is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders. The PHQ-9 is the depression module, which scores each of the nine DSM-IV criteria as “(0) not at all” to “(3) nearly every day,” regarding how often in the last two weeks a participant has experienced each symptom. The internal reliability of the PHQ-9 is excellent (Cronbach's alpha = .86-.89) with good test-retest reliability ($r^2 = 0.84$; Kroenke, Spitzer, & Williams, 2001).

The Generalized Anxiety Disorder (GAD-7), is a 7-item scale for anxiety with the same referent period and response options as the PHQ-9. The measure has shown good test-retest reliability (intraclass correlation = .83), and strong internal consistency (Cronbach's alpha = 0.92). Scores on the GAD-7 are strongly correlated with multiple domains of functional impairment and yield a measure of symptom severity as well as a cut-off score (Spitzer, Kroenke, Williams & Lowe, 2006; Swinson, 2006; Kroenke, Spitzer, Williams, Monahan & Lowe, 2007).

Perceived Norms. The *Drinking Norms Rating Form* assessed perceived norms with a modified version that asked normative perceptions of alcohol and other drug use behaviors, including SC. Participants were asked to estimate the percentage of individuals within a certain population (soldiers, civilians and matched gender civilians) that had used a specific drug within the last year (Baer, Stacy, & Larimer, 1991).

Results

Prevalence.

First, it is important to note that sample size varied by analyses. The largest sample was 368, which included all participants who completed a brief screening. Of these, 199 met eligibility criteria for the larger study and enrolled in the trial, thus completing additional assessments. We used all available data for examining each question. Only those who were enrolled in the larger trial (N=199) completed questions regarding mental health, perceived norms, and consequences of substance use.

Of the 368 soldiers who completed screening, 346 (94%) reported consuming alcohol and 108 (29%) reported some drug use other than alcohol in the past 90 days. In total, 41 reported past 90 day SC use, representing 11% of all participants and 38% of those reporting any drug use other than alcohol.

Of the 108 participants with recent drug use, 92 indicated a drug of choice 27 of whom listed SC. In comparison, only 13 listed marijuana, 35 listed opioids, and 20 listed another substance (i.e., Ecstasy, sedatives, methamphetamine, bath salts). Note: three participants listed two drugs of choice.

Demographics by substance use

In examining demographic differences, we compared those who reported using SC (N=41) versus those who used other drugs but not SC (N=67) versus those who

only reported alcohol use (N=260). For dichotomous and continuous demographic characteristics, two dummy variables were created, one representing alcohol use only and the other drug use only. Linear and logistic regression analyses measured demographic characteristics as a function of these two variables with SC being the reference category. Chi-square tests were performed to examine differences in demographic characteristics with more than two categories (e.g., race and religion). The small proportion of women prevented meaningful comparisons by gender. There were no significant differences in race, ethnicity, deployment history, or religion.

Differences were observed with respect to age, marital status, education, and income. Regarding marital status, chi-square analysis revealed an overall effect as a function of group, χ^2 (n=366; df=6) = 16.11, p = .013. Follow up analyses revealed that SC users were more likely to be single (53%) than other drug users (34%; p = .011) and alcohol only users (33%; p = .049). Comparisons of age indicated that SC users were younger than alcohol users, t (363) = -3.95, p = <.001, but did not differ from other drug users. Users of SC were also more likely to have less education than alcohol only users, t (363) = -2.77, p = .006, but did not differ from other drug users. Finally, SC users reported earning lower income than other drug users, t (360) = -2.35, p = <.019, and alcohol only users, t (360) = -4.25, p = <.001.

A chi-square analysis examining likelihood of using SC as a function of Military Occupation Specialty indicated no overall differences among categories, χ^2 (n=366; df=12) = 11.85, p = .458. Relative to those who never used SC, participants who

reported having used SC reported fewer years of service than other drug users, t (361) = -2.33, p = .020, and alcohol only users, t (361) = -3.60, p < .001.

How does SC use relate to mental health variables (PTSD, anxiety and depression)?

Among those who completed mental health measures (N = 199), SC users were compared to other drug users and only alcohol users on three variables. Ten participants elected not to complete the PTSD assessment. No differences were found in PTSD symptoms using the overall PCL score, likelihood of exceeding a threshold of 25, or likelihood of exceeding a score of 28, all p 's > .20. Depression analysis indicated that SC users endorsed marginally fewer depression criteria than other drug users, t (196) = 1.80, p = .074, but did not differ from alcohol users. Synthetic cannabis users also showed marginally lower severity of depression symptoms relative to other drug users, t (196) = 1.78, p = .076, but did not differ from alcohol users. Users of SC did not differ in number or severity of anxiety symptoms from either group.

Consequences of SC versus alcohol and other drugs.

Linear regression was used to evaluate lifetime and past 90-day problematic consequences of alcohol and drug use as a function of using drugs other than SC or alcohol relative to SC. Results revealed no differences between SC users and other drug users; however, SC users reported experiencing more problems than alcohol only

users on problems ever experienced, $t(196) = 1.94$, $p = .053$, as well as problems experienced in the past 90 days, $t(196) = 2.85$, $p < .005$.

Synthetic cannabis and alcohol abuse/dependence.

The majority of the larger, screening sample (74.7%) met criteria for either alcohol abuse (19.8%) or alcohol dependence (54.9%). Logistic regression analyses indicated that participants who reported using SC in the past 90 days were no more likely to meet alcohol abuse or dependence criteria relative to other drug users or alcohol only users.

Synthetic cannabis and drug abuse/dependence. Approximately one fifth of the screening sample (22.0%) met criteria for either drug abuse (5.7%) or drug dependence (16.3%). Logistic regression analyses indicated that among participants who reported using drugs other than alcohol (N=108) SC users did not differ with respect to meeting drug abuse criteria, but were significantly more likely to meet drug dependence criteria, $OR = 2.50$, $\chi^2 (n=108) = 4.86$, $p = .027$. Among participants who used SC, 12% met criteria for drug abuse and 68% met criteria for drug dependence. In comparison, among other drug users, 24% met criteria for drug abuse and 46% met criteria for drug dependence. Synthetic cannabis users endorsed an average of 1.87 (SD = 1.25) symptoms of drug abuse and 4.49 (SD = 2.36) symptoms of drug dependence. The proportion of participants who listed SC as their drug of choice who met each abuse and dependence criterion for SC is provided in Table 1.

Perceived Norms.

A series of t-tests were conducted to compare participants' perceived norms for active-duty military personnel relative to civilians across nine substances (see Table 2). For seven of the nine substances participants perceived the prevalence of use to be significantly higher among civilians. Synthetic cannabis was the only substance with the opposite pattern. Participants perceived SC use to be significantly more prevalent among military personnel than among civilians. For bath salts, perceived prevalence did not significantly differ between soldiers and civilians.

Discussion

The prevalence of SC use, consequences of use, and how SC clinically presents compared to other substances are new territory in research. Synthetic cannabis use among military samples is even less studied. However, SC may be particularly attractive to military personnel given the difficulty inherent in its detection. This study is the first in our awareness to present data regarding SC use among an Army sample who were seeking a brief and low-burden intervention for their alcohol or drug use. All screened participants had used drugs or alcohol in the past 90 days and were active-duty Army personnel. Participants who completed a baseline assessment also met criteria for abuse or dependence on a substance, and this sample in general scored high on measures of psychological distress including PTSD symptoms, depression and anxiety. The study does not include a comparison group of soldiers from the general Army population.

Synthetic cannabis use is prevalent among military personnel struggling with substance abuse. Synthetic cannabis was the most frequently indicated illicit substance reported in this sample (38% of those reporting any drug use). In contrast, only 14% identified marijuana as their drug of choice. Other studies have found lifetime rates of SC use among college students between 8.1% and 14.2%, with one study reporting a 7.1% past-year rate of use (Hu, Primack, Barnett & Cook, 2011; Stogner & Miller, 2013). Similarly, Johnston and colleagues (2013) found a past-year rate of use at 5.0% in a nationally representative sample of adults aged nineteen to twenty-eight. Among the subset of marijuana using university students, lifetime use of SC ranged from 21.0% to 24.3% (Hu, et al., 2011; Stogner & Miller, 2013).

This suggests that SC is appealing to military personnel. Routine drug testing may curb marijuana use among soldiers, but inflate use of SC given the pervasive perception that it is immune to detection. Synthetic cannabis use should be assessed among the general active-duty population to further elucidate the prevalence of its use. Two possibilities for doing so would be to include questions on SC in confidential assessments like the annual Unit Risk Inventories provided through the Army Substance Abuse Program's Prevention Division or the Health Related Behaviors Survey conducted by the Department of Defense. Similarly, providers working with other populations that are regularly drug tested, such as individuals who are under court supervision, should be aware that SC may be a uniquely attractive substance and that assessment of use is encouraged. This is particularly important in the Army where the primary route to treatment is through its random drug testing program (IOM, 2012). Still

largely undetectable through standard drug screens, SC users are at risk of falling through the net created by the Army to identify and treat problematic substance use.

Interestingly, SC was the only drug that soldiers perceived as being more widely used among Army personnel than civilians. All other substances of abuse were thought to be used less among Army personnel. Although it's unlikely that SC is being used by a third of Army personnel (the belief in this sample), the perception that SC is more popular among soldiers than civilians may very well be accurate. With drugs such as alcohol, higher perceived norms have been cross-sectionally and prospectively associated with increased use (Neighbors, Dillard, Lewis, Bergstrom, & Neil, 2006). Thus, the high perceptions of use among Army personnel may lead some personnel to use more. It's worth considering that misperceptions of novel drugs may be common and unlikely unique to the military (Miller, Boman, & Stogner, 2013). This is an area for future longitudinal research to address questions about directionality of the effects, particularly given that actual rates of SC use in the military are unknown. Normative interventions such as social norms campaigns (e.g., Perkins, Linkenbach, Lewis, & Neighbors, 2010) or individualized normative interventions (e.g., Neighbors, Larimer, & Lewis, 2004) have potential as prevention strategies among soldiers and are included in interventions such as Prime for Life (Daugherty & O'Bryan, 2004) adopted for use by Army Substance Abuse Programs and other military branches.

Findings from the current study suggest that DSM-IV criteria for abuse and dependence apply well to SC. Of the abuse criteria, three out of the four variables were endorsed by at least 48% of users, with the majority of participants who used SC

reporting that their use resulted in failing to meet obligations or resulting in physical hazards. Few (12%) SC users reported their use resulted in legal problems. Perhaps this is because SC is a relatively new drug and is difficult to detect. Alternatively, SC may be a substance that lends itself less frequently to behavior that could draw attention from law enforcement.

With regard to dependence criteria, all dependence variables were endorsed by at least 32% of SC users. The experience of withdrawal symptoms was reported the least frequently and using more SC than intended was the most endorsed dependence item (78%). Using despite the experience of psychological or physical problems and spending a lot of time using or recovering from SC were also items endorsed by the majority of SC users. Participants who had used SC were more likely to meet drug dependence criteria than those who had not used SC, but were no more likely to meet alcohol abuse or dependence criteria. Awareness raising about SC and its consequences should occur with professionals working with mental health and substance abuse in the military. These clinicians should assess for SC use and be aware that some soldiers may be experiencing negative consequences related to use or struggling with an inability to quit or cut down.

In this sample, SC users tended to be young, less educated, lower income and more likely to be single. These findings are consistent with the demographic characteristics of civilian SC using samples (Hu et al, 2011; Stogner & Miller, 2013; Stephens, 2011, Johnston, O'Malley, Bachman & Schulenberg, 2013). Additionally, those who identified SC as their drug of choice report similar levels of distress on

measures of PTSD symptoms, depression and anxiety as those whose drug of abuse is alcohol. Personnel who are abusing drugs other than alcohol or SC report the highest level of psychological distress on these measures. It's important to note that this sample was very high on symptoms of psychological distress.

Overall, SC is a substance that appears to be popular among those in the military, fits the model for a substance of abuse and dependence, and should be included in risk assessments of military personnel. Further research should explore rates of SC use in a general sample of military personnel and how normative perceptions of use may be related to use and problems. Similarly, because SC users reported experiencing adverse consequences associated with their use, confidential interventions such as the Warrior Check-Up (Walton, et al., 2013), intended to support military personnel in taking stock of their drug/alcohol experiences and think through their options, should include a focus on the soldier's SC experiences.

Table 1: *Proportion of Abuse and Dependence Criteria Met for SC Users*

DSM IV placement	Criteria	Proportion Met
Abuse 1	SC use resulting in failing obligations	58.54%
Abuse 2	SC use resulting in physical hazards	68.29%
Abuse 3	SC use resulting in legal problems	12.20%
Abuse 4	Continued SC use despite resulting interpersonal problems	48.78%
Dependence 1	Increased SC use to get same effect	63.41%
Dependence 2	Withdrawal symptoms	31.82%
Dependence 3	Using more SC or for longer than intended	78.05%
Dependence 4	One or more attempts to cut down	53.66%
Dependence 5	Time spent getting SC or recovering from effects	73.17%
Dependence 6	Used SC instead of hobbies or family/friends	58.54%
Dependence 7	Continued use despite psychological or physical problems	73.17%

Table 2: *Perceived norms for prevalence of drug use among active-duty military personnel versus civilians.*

Drug	ADMP		Civilian		<i>T</i>
	Mean (%)	SD	Mean (%)	SD	
SC	29.30	24.30	23.33	21.34	3.19**
MJ	20.99	19.02	49.78	23.31	-18.89***
Cocaine	12.26	15.26	26.78	20.00	-11.63***
Hallucinogen	11.10	14.48	21.60	19.29	-8.45***
Inhalants	12.70	16.76	18.58	18.14	-5.08***
Opiates	19.98	21.88	25.63	21.13	-3.70**
Bathsalts	11.28	14.49	11.34	13.44	-.41

Stimulants	15.33	19.20	26.75	19.97	-7.27***
Sedatives	17.32	19.05	27.53	20.40	-5.65***

Note. t's represent differences in perceptions of ADMP versus Civilians. N's ranged from 161 to 196, depending on missing responses.

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Contributors

Authors A, B and C conceptualized the study design. Author A led the writing of the manuscript and wrote the methods and discussion sections. Author B ran all analyses. Authors C and D wrote the introduction, conducted the lit review and provided comments, feedback and editing of the manuscript. Authors E, F and G provided comments on drafts, participated in the conceptualization of the study and are Co-Is on the parent grant.

Conflict of Interest

All other authors declare that they have no conflicts of interest.

Spice paper Highlights

- Among the study's sample of active-duty Army personnel who used an illicit substance in the past 90 days (n=108), synthetic cannabis was the most prevalently abused substance at 38%.
- Synthetic cannabis users were found to be younger and less educated than users of only alcohol, but were similar to users of other drugs. Spice users were more likely to be single and have lower income than both other drug users and alcohol-only users.
- In terms of mental health, SC users indicated fewer and lower severity depression symptoms. Spice users did not present significantly different than other soldiers with regard to anxiety and PTSD symptoms.
- Soldiers perceived SC to be the only substance, or category of drugs, that is used more by active-duty soldiers than by civilians.
- SC-using soldiers experienced problems related to their use that were consonant with DSM abuse and dependence criteria.